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BOARD OF EDUCATION.

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ON

HIGHER EDUCATION

WITH APPENDICES

FOR THE YEAR 1902.

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GENERAL REPORT *for the year* 1902 *by* C. A. BUCKMASTER, ESQ., *one of His Majesty's Chief Inspectors, on* SECONDARY SCHOOLS, SCIENCE CLASSES, ART CLASSES, *and* EVENING SCHOOLS, *in the* SOUTHERN DIVISION OF ENGLAND, *comprising the counties of* WORCESTER, OXFORD, GLOUCESTER, BERKS, SOMERSET, DORSET, DEVON, CORNWALL, WILTS, HANTS, *and* KENT, *with part of* LONDON.

MY LORD,

I have the honour to submit to you a general report on the work of my Division.

The transfer of the supervision of the Evening Schools from Whitehall to South Kensington, which has been completed since my last report, has brought the Inspectors of the latter branch into intimate contact with many varieties of educational work with which we were previously only generally acquainted. The novelty of much of this work has impressed itself deeply on my colleagues in this Division and it will be seen from the information with which I have been furnished that a marked freshness of view has thus been secured. I propose, therefore, to devote the greater portion of this present report to the consideration of some of the more obvious problems presented by these evening schools. Many of the conclusions to which we have been led have already found expression in the reports of colleagues published last year, notably in that by Mr. F. Pullinger, but as my own division differs widely from his in character, habits of thought, and industrial pursuits some at least of these conclusions may perhaps deserve restatement.

The great variety presented by the evening schools is the first characteristic which impresses the observer. But though the variety of subject is almost endless yet the number of types is limited and the whole of the evening classes may be roughly but effectively arranged in six or seven well defined groups. This arrangement has been carefully worked out by Mr. Swain, whose district comprises the three counties of Hampshire, Wiltshire, and Dorset, and may be usefully given in his own words:—

"Evening schools carried on in this district may be conveniently divided into six different groups, in each of which, though there may be considerable overlapping, there is a class of student distinct from that met with in the other divisions. These groups comprise the Science and Art Classes so long established under the Department of Science and Art, pupil teacher classes, elementary continuation classes, technical and technological classes, recreative classes, and lastly a group which may be described as Home Industry Classes.

"(1.) *The Science and Art classes* in the old sense flourish more particularly in the larger centres such as Portsmouth Technical Institute, The Hartley University College, Southampton, The Technical School at

Swindon, and, to a smaller extent, at Eastleigh, Ryde, Bournemouth, Salisbury, Trowbridge, and Chippenham. In Dorset classes of this type exist only on a small scale, nor is there throughout the county any centre boasting of a well-equipped technical school of considerable dimensions. These classes are attended mainly by those teachers who are anxious to increase or improve their certificates, pupil teachers who do not attend a special centre, apprentices to the building trades, teachers seeking to qualify for the earlier stages of the London degrees, Chemists' apprentices, and those attached to engineering works of various types. They represent necessarily a heterogeneous collection of students who, in many cases, have had to commence earning a livelihood before being properly equipped by a properly graded education. They belong to a class to whom the facilities for study offered by the late Science and Art Department for many years were of very great value, and under the existing arrangements for young people in the various professions and trades this class of student is likely to remain as a factor to be considered in the educational scheme of the county or borough.

"(2.) *The Pupil Teacher Classes* are a distinct section, they are composed mostly of girl students whose time is very limited and whose objective is the King's Scholarship examination. Their studies are mostly carried on at a time when body and mind are fatigued and the variety of subjects which they have to study in such a way hinders all breadth of development, while the study of any subject with a view to subsequent teaching of the same seems almost impossible. The counties of Dorset, Hampshire, and Wiltshire have looked at the pupil teacher question in different ways. These have been determined largely by the attitude of the technical committees towards elementary education. In *Dorset* the committee has considered hitherto that the training of pupil teachers is a matter for the elementary authorities, and doubtless paucity of funds has helped this policy, the imperial grant to the county being a diminishing amount each year. Local people have been left to start classes which in the main are attended by pupil teachers, but no special terms are offered by the County Committee to such classes beyond those offered to any other students. There are no special arrangements for pupil teachers to attend classes in secondary schools in the week days. In *Hampshire* the Technical Committee has regarded the pupil teachers more favourably and local managers have been encouraged to start classes at definite centres, the county undertaking to pay the teachers and provide a certain portion of travelling expenses. But the greatest effort has been made in *Wiltshire* where day classes for pupil teachers, in the secondary county schools, have been organized. The staff of the day schools has been strengthened to meet this demand, and liberal grants have been offered by the County Committee for each pupil teacher who makes not less than 9 hours' attendance per week at the secondary school. There does not seem to have been as yet any successful effort to teach the pupil teachers in the same classes as the secondary day school students, though it is difficult to see why this should not be attempted. Any drastic alterations in the present system of pupil teachers must necessarily involve a large increase in the cost of the staff at any school; for if, as has been suggested, the pupil teachers were to give the whole of their time, say for three years, to secondary school studies, their place would have to be supplied at least for the next three years by a qualified staff which is at present non-existent. Such a change would have to be introduced gradually, for there is still a vast body of opinion in favour of young pupil teachers getting used to method and class management at a very early age.

"(3) *The Technical and Technological Classes* proper can only flourish in connection with a well-equipped and well-organized central institution such as exists at Portsmouth, Swindon, and Southampton. The students at these classes are definitely engaged in local industries, and their attendance at the evening classes is wholly with a view to perfecting themselves in the theoretical side of their practical daily work, so that the principles underlying the various trades should be properly mastered by those apprenticed to them. When such technical institutes take their

proper place in connection with the industries of the neighbourhood it seems only reasonable to expect that attendance at suitable classes shall form a definite part of the duty of an apprentice. This supposes the closest co-operation on the part of leaders of industries and managers of works with the governors of the technical school in their neighbourhood. The course at the technical institutes at Portsmouth, Southampton and Swindon are becoming more and more organized with a view to this policy of co-operation. The new buildings for the Municipal Technical School at Portsmouth are not yet started although the site has been acquired and the plans approved long ago. The present accommodation is most unsatisfactory. The Hartley College at Southampton has secured recognition as a University College and will henceforth, it is hoped, take the leading part in higher education in this district.

"(4) The continuation classes in the strict sense of the term are still very largely devoted to the recovery of work done in the day school years ago rather than to the continuation of studies for which the students acquired a taste when at school. The very elementary character of much of the work in Arithmetic, History, Geography, and other day school subjects must not, however, in every case, be regarded as an adverse comment on the day school work. But it is difficult to evade the suggestion that if the boys and girls left the day schools with a reasonable aptitude for study, or having acquired studious habits, the rudimentary work of earlier years would not be so completely lost. I refer entirely to subjects taken in the day school. The poor work in drawing, the very elementary syllabuses of needlework, the simple character of the exercises in mensuration, etc., all seem to me to point to a want of grounding in the day school. But it cannot be doubted that, in a vast number of cases, the children leave the day school just as their faculties are beginning to rapidly develop, and the practice in so many schools of compelling the few boys in an upper standard to take their lessons with those below them must inevitably discourage them and make them long to be away at work. But so long as the prospects of a teacher are dependent on the number of the 'standards' in which he has been experienced, so long will the temptation exist to retain one or two boys at the top of a school when they ought to be drafted into other schools where they can form a class of their own.

"(5) The recreative evening classes include all those which appear to have no object beyond temporarily interesting young people and occupying their time usefully while keeping them out of mischief during the long winter evenings. This type of class is not sharply marked off from the home industry or other classes. It includes a great deal of wood-carving, metal work, repoussé work, etc., which are in no sense taken up with a view to the development of industry although the students in some cases may find a market for their productions. That such classes have their uses is not to be doubted, though they can form no part of a genuine scheme for technical instruction. To attempt to direct this energy into channels which might subserve the purposes of industrial development, would be, I think, in many cases a policy founded on ignorance of human nature, and therefore bound to fail. If fundamental work in drawing, designing and modelling be insisted on in such recreative classes the students are sure to lose heart and the classes would drop. If they subserve a useful purpose their lapse could but be regretted. It is for the local authority to decide how far the term 'education' can be made sufficiently elastic to justify a subsidy for such classes. If the groundwork were better laid in the day school we might expect the young people to find their recreation in the genuine development of a well-grounded industry. In evening classes for handicrafts, the motive is necessarily far more utilitarian than educational in the sense of using the subject as a vehicle for the formation of character, but it cannot be too much insisted on, that it is in a sure foundation that true stability exists, and the proper development of any manual industry can never be assured where the groundwork has not been well and truly laid.

"(6) The home industry classes are probably the most popular of all the

evening classes. The subjects appeal to the students as of immediate utility; they are intimately connected with everyday life and surroundings, and, if in many cases a very great degree of skill is never attained, sufficient for useful purposes is easily mastered. Such subjects as cookery, laundry, dresscutting, dressmaking, needlework, nursing, and ambulance, lend themselves very easily to efforts to improve the life and surroundings of the working classes. They do not, I think, in any way assist the development of industries, they rather, by teaching people to work for themselves, diminish the demands for cooks, dressmakers, needlewomen, and nurses. I have even known a carpentry class advertised as intended 'to enable people to do odd jobs for themselves,' and useful as this is, one cannot help thinking that this was not the object of the promoters of the Technical Instruction Acts. One enthusiastic attempt has been made to start a cobbling class to enable villagers to mend their own shoes and boots, while there are one or two upholstering classes to instruct people how to mend their chairs, &c. All such attempts are extremely interesting, and anything that would inculcate the spirit of self-help is to be admired."

Mr. Tutton, in his report on the counties of Worcester, Gloucester, Oxford, and Berkshire, also draws attention to the position of some of these groups. In regard to those described above as continuation schools he says:—

"There is a large proportion of evening schools which take only subjects of Division I. of the Regulations for evening schools, that is the subjects of what were formerly called evening continuation schools. My impression of the vast majority of these schools which take only the most elementary subjects is that their educational value is very small. If the primary day schools of the locality were fully discharging their *rôle* these evening schools would be unnecessary. For they are attended by a surprisingly large proportion of pupils under fourteen years of age, who ought still, from their youth and the low standard of their elementary knowledge, to be attending in the day time an elementary school. They have not been exempted by the granting of a labour certificate, ordinary or otherwise. Moreover, frequently when they have done so it has been because the standard of exemption happens to be unduly low as it unfortunately still is in some parts of our agricultural counties.

"Where these evening classes are not largely filled with pupils of this type they partake more or less of the character of classes for social and philanthropic purposes; in other words, classes to attract young people and remove them from the mischief of the streets. This is, of course, an exceedingly worthy object, redounding greatly to the credit of the originating manager and teachers, who strive so earnestly for the good of the young people of their locality, but it is, to say the least, doubtful how far it is the function of the State to subsidise it with grants.

"There is one further originating cause for a not inconsiderable number of evening schools of this type, namely the desire on the part of an ill-paid elementary schoolmaster to legitimately increase his stipend, which is often miserably small in country schools.

"In any case, in my opinion, the *onus* of financially aiding and inspecting evening schools of the character which has been described, could safely be left to the local authority. The State grants to the primary day schools on the one hand, and to secondary and technical schools on the other, ought to suffice, without requiring State expenditure on this very questionable form of evening primary school. If a truly educational need for such schools is found in the future, in my opinion the local authority will be to blame: if, on the other hand, they are not really essential but advisable for other than educational reasons, the local authority will both be best able to ascertain the fact and be the most suitable patron.

"Further, the inordinate expense of State inspection of these evening schools forces itself on our attention. They are among the most difficultly accessible of all the schools under our supervision, and although the expense is minimised as much as possible by giving the inspection into the hands

of the Whitehall inspector who visits the day primary school held in the same building, still, in proportion to their value, these schools are relatively the most costly to inspect.

"Of course, it will be obvious that the modern foreign language subjects of Division I are not referred to in the remarks just concluded relating to exclusively Division I schools. Nor are Latin, Book-keeping of the more advanced kind, Shorthand, Economics, or Mercantile Law and Practice. Moreover, such subjects are usually only taught at the larger secondary and technical schools, in which the subjects of Divisions II, III, IV, and V are also taught in the evening."

Mr. Edwards, who is in charge of the South-Western district, including the three counties of Cornwall, Devon, and Somerset, also writes in rather a pessimistic strain in regard to the evening school work. As he has more than five hundred such schools in these counties, the opportunities for drawing some general conclusions are abundant.

Mr. Edwards reports that:—

"The majority of evening schools are held in elementary school buildings, and the subjects taught are chiefly Mensuration, Arithmetic, Geography, and Drawing. A fairly large number are somewhat more ambitious and attempt 'Elementary Science'; the advisability of taking the last subject, either from the utilitarian or educational point of view, is more than doubtful.

"Other evening schools are of a more advanced type, and are held in more or less properly equipped technical institutes. These are able to undertake such subjects as Building Construction, Machine Construction and Drawing, Hygiene, and Electricity and Magnetism.

"Many classes take Woodcarving, and there are also a large number where Needlework and Dressmaking are taught.

"The value of the teaching is detracted from as a rule where the more technical or scientific subjects are taken, by the fact that the students are unable to read or write with even moderate facility, so that they are unable to put down intelligent notes in their own words of what they are told or see. The result is that notes—often so short as to be quite meaningless, even misleading—have to be dictated by the teacher. A *viva voce* examination of the students shows that they evidently do not properly understand what they have noted. Hence it would appear to be advisable not to attempt any subject of science unless the greatest care has been exercised as to whether the students are able to comprehend and benefit by it. The teaching of geography can and ought to be made a more interesting, as well as educational, subject than it is now in many evening schools. It is true that lantern slides are largely used, but they are frequently most inappropriate and quite useless, either as a means of showing what a country is like, or for attracting and keeping the attention of the class.

"Mensuration—really, as a rule, arithmetic under another name—is in most schools intelligently taught, and considerable progress is made in it.

"Among the 113 evening schools in Cornwall are included several important technical institutes, namely, those at Camborne, Redruth, Penzance, and Truro. The remainder are chiefly schools held in various villages and including the quite elementary subjects in their timetables. I fear that many of these classes are very poor, both with regard to the number of students attending and also the character of the instruction.

"There is no doubt that the operation of the Technical Instruction Acts has not been as efficient as it might have been, owing to the original arrangements made. It seems that Cornwall was arranged in 20 different districts, each with a separate local committee. The sum of £50 per annum was allocated to each district. Some of these committees set out a definite plan and made good use of their money, but others, undoubtedly, wasted it and several did not make any use of it at all, with the result that there is now a large balance of several thousand pounds lying in the bank.

The lethargy and want of interest of some of these Committees will consequently be somewhat of a blessing, as under the new Act of 1902 this accumulated money will no doubt, now, have to be used."

It will thus be seen that while recognizing that evening schools are of very various types and each characterised by widely different degrees of efficiency, my colleagues have yet, on the whole, not been favourably impressed by them.

Evening Schools in London.

My own personal experience has, during the past two years, been acquired chiefly in London, part of which with the county of Kent forms my own district. In London the schools under the Technical Education Board are the fewer in number and do the greater portion of higher work. The evening schools under the London School Board are much more numerous, and have generally a somewhat humbler, though, possibly, a not less important function, for in them the bulk of the elementary teaching is given in the literary and commercial subjects.

But unfortunately, the impression formed in early visits has not been removed on more complete acquaintance, and the School Board in its laudable anxiety to throw the educational net as wide as possible, has secured quantity at the expense of quality. As missionary agencies the schools abundantly justify their existence, they bring the opportunities for improvement near to all in all parts of the metropolis, but as centres for real solid work they are not so successful in spite of the best efforts of the teachers, the majority of whom are most enthusiastic and devoted to their work.

My junior colleague, Mr. W. Pullinger, draws attention to three of the points which in our opinion unfavourably affect the work in many of the evening schools under the London Board. The first of these is the "staffing rule." Where the average attendance of a school falls below twenty-five per teacher per evening, a reduction in the number of teachers on the staff is required. This rule leads to some unfortunate results, viz.:—

(a.) Certain classes, such as dressmaking, are often too large for the best efficiency; to divide such classes might mean the extinction of a small class in, say, English Literature, in which excellent work was being done. Thus small classes in not very popular subjects depend for their existence on too large classes in other subjects. This rule is fortunately sometimes held in abeyance, and there seems recently to be an inclination to keep as many classes open as possible, perhaps with the view of handing over a large number to the new authority when created.

(b.) The casual student who attends now and then is welcome, since he helps to keep the average up.

(c.) It, to some extent, ties the hands of teachers in the matter of home-work; if home-work were insisted on, classes might fall below the necessary minimum, and then possibly that teacher would have to go.

The second point deals with regularity of attendance. In this

respect the general effect of the imposition of a fee has yet to be discovered. In some schools there is distinct evidence of improvement, as the number of students enrolled has diminished while the average attendance has increased. In some districts the fee has not been large enough to influence either the number on the roll or the regularity of attendance.

The attendance generally is still very irregular, and this leads to the spoiling of many classes for the regular students, and acts with a chilling effect on the enthusiasm of the teachers.

It cannot be said that the School Board for London sets a very high ideal before the students in this matter, since "Certificates are awarded to all students who have received at least fourteen complete hours' instruction in one or more subjects and made diligent progress in the same."

Apart from the inevitable external causes which affect the regularity, it would seem that the extremely lenient manner in which students are treated has some effect. Students are frequently allowed more freedom than would be permitted to undergraduates at the Universities, though many of them have only just left the elementary schools. Teachers are sometimes almost afraid to offend their students, and leave them the complete mastery of the situation. It seems highly probable that increased strictness would react favourably on the regularity, though it might for a time reduce the number of students on the books.

Thirdly, there remains the general question of home-work. The importance of home-work varies with the subject. In some subjects home-work is essential, without it it would be as well to close the class. For example, classes in elementary French, when students attend not more than two hours per week can rarely be of much utility when not backed up by preparation. In the majority of schools, however, there is little or no serious effort made to encourage home-work. This arises from three causes, viz.: (1) fear of diminishing the classes; (2) extra work for the teacher—correcting exercises, etc.; (3) the fact that the School Board (in many cases) supplies all books and instruments, so that students cannot work at home, for even if they are willing, they cannot as a rule take the books home. The fault of too liberally supplying books which students require for home study, lies with the responsible teachers who have the option of requisitioning them.

The excuse often given for the fact that no home-work is done is that students have no time to do it, or no place at home where they can work. In most cases this excuse is quite fallacious.

It is difficult to suggest any immediate or complete remedy for these defects. Probably it would be better to be satisfied with fewer pupils, smaller classes, even less frequent opportunities for attendance, and to insist on greater regularity on the part of students, systematic home-work, and some defined restricted course of study, in place of the present plan of throwing down all kinds of educational facilities before students,

many of whom are incapable of profiting by them, and whose attendance impairs the utility of the class for the better-prepared minority.

Evening Schools in the Country.

As has already been pointed out, much of the work in country districts is quite spoilt by this want of preparation. One sub-Inspector even goes so far as to venture to suggest that the better-prepared of the elementary school scholars rarely go on to the evening school, as in no other way can he account for the extremely elementary character of much of the evening school work.

There is still too much of the private venture about some country schools, and in this respect steady insistance on fixed salary for the teacher, active interest on the part of local managers, and some adequate financial responsibility on the part of the locality, will in time improve the status of the rural evening school, and strengthen it for more lasting benefits to the community.

The line which divides those subjects on which the Board is prepared to pay grants must often be a difficult one to draw either firmly or clearly, and it will occasionally happen that one subject may come on one side of this line, while an apparently similar subject is on the other. There is, however, one matter connected with the Home Industry Classes which deserves careful consideration. We find a tendency in certain cases, notably in some classes for Basket-making, Woodcarving, and Art Needlework, not so much to go through a progressive course of instruction as to make goods for sale. Such a practice seems to be a perversion of the spirit of the evening school regulations, and to raise questions of serious economic importance.

Secondary Schools.

The two years which have elapsed since my last report have witnessed a great increase in the work of inspection not only as far as evening schools are concerned but still more in the case of secondry schools. The application for the recognition of schools for the purpose of the Registration of Teachers brings the Inspectors of the Board into relation with an increasingly large number of private and proprietory schools. As these schools educate more or less efficiently a very large proportion of all those children who receive some form of education other than that of the elementary school their position in the educational supply of the nation is of great interest. In my own division some two hundred such schools are at present awaiting an Inspector's visit. In regard to those secondary schools more directly connected with the Board, Mr. Tutton reports as follows:—

"The past two years have been most interesting ones to secondary schools. They have seen the commencement of the systematic inspections under the Board of Education Act, 1899, and the widening of the Board's grants and supervision so as to include practically all types of secondary schools, the former restriction to such schools only as devoted a large proportion of time to Science being swept away.

"The numerous inspections under the Board of Education Act have been educationally of the same thorough descriptions as those which the inspectors of this Branch have always conducted in the secondary schools formerly termed Schools of Science and which included inspection of the foreign language subjects together with a fuller inspection of the classical subjects and a complete enquiry into the administration of the school by the administrative examiners of the Board. It is interesting to record that two purely private schools have been so inspected in this district, and that the Technical Instruction Committee of the Berks County Council, which has been acting as a Clause VII Authority, considered it of value, as indeed it most certainly proved to be, to have the whole of the secondary schools which it aids inspected in this manner under the Act. Inspections under Board of Education Act, 1899.

"The widening of the limits of our purview of secondary schools which has been referred to, following from the classification of secondary schools into two types, A and B, of which Division A schools are those of the type formerly misnamed Schools of Science, and Division B includes all other secondary schools which are sufficiently moderuised as to include the very small amount of four hours science per week, will materially increase the number of these inspections under the Act. For every new School of either type has to be so inspected in the first year of its acceptance, and all other aided secondary schools every three years for the purpose of reassessing the block grant.

"This district is fairly well supplied with secondary schools for boys, and there is reason to believe that several which have not yet placed themselves under the Board's supervision are contemplating doing so in the near future, laboratories being now in course of construction. One secondary day school has had to be removed from the list of recognised schools, on account of inadequate buildings. It is to be hoped that this is only temporary, and that the new Local Authority will prove able to act up to its responsibility, by providing an efficient secondary and Technical school. Additional Secondary Schools for Recognition.

"Mr. Crofts draws my attention to a point in connection with secondary schools which is of considerable importance. He says :—

"'There are still some well-equipped secondary schools which hesitate to work in unison with the Board. This is due almost entirely to a misconception on the part of the headmasters. They are under the impression that if their schools become Government-aided schools, they will lose their individuality and will be tied down by hard and fast rules to a cut and dried curriculum. This is a great mistake. Secondary Schools in Division A are expected to show a somewhat high standard in science, and the nine hours devotedto it is a big slice out of the weekly time-table. In Division B, however, only four hours are required for pure science work, and in many of the schools referred to this is already given. It is, moreover, not dictated to the schools what science shall be taught, so long as it is useful for the class of pupils under instruction. As regards the non-science work, the school goes on as formerly, but the Board require that any subject which is professed to be taught shall be taught efficiently. There is one more objection put forward by other headmasters, that boys must move forward every year regularly, whether they are fit for promotion or not. This is, of course, not the case, for no Inspector would think of pushing a boy forward if he had not properly assimilated the year's work.

"I am glad to be able to add one thing to Mr. Crofts' remarks, namely, that the formerly very prevalent impression that the Inspectors of this Branch of the Board were desirous of urging science to the detriment of literary and classical subjects, is now passing away. It was largely due to the nomenclature adopted, for well-known reasons which now no longer exist, for the various types of aided schools, such for instance as the unfortunate name 'School of Science' for secondary schools spending two-thirds of their time on literary and ordinary mathematical studies.

Leaving Certificate.

"I desire to call attention to the great value, at present little known and appreciated, of the leaving certificate which the Board issues to secondary day school pupils who have completed a three years' course and passed the advanced stage of three of the obligatory subjects of the third year's course. It may be that the latter condition has militated against the certificate being more frequently applied for. I strongly recommend that an alternative certificate be offered, namely one after the completion of the fourth year's course unencumbered with any condition as to passing examinations. Such a certificate might well be accepted instead of the preliminary examination now required for admission into the various professions, and would afford any employer an excellent guarantee of the character of the education of his employé.

Dual and Girls' Schools.

"The dual schools in this district are working admirably, but there is a great dearth of secondary schools for girls only. While on the whole strongly approving of dual schools, as distinguished from mixed schools, I wish to point out the desirability of such schools adopting a more rational curriculum for their girls. Mr. Crofts reports to me regarding this matter very tersely as follows :—

"'The chief disadvantage of working the two sexes together consists in the fact that the curriculum for the girls is, presumably on account of expense, more or less identical with that for the boys ; indeed, they are carried on more as mixed schools than as dual schools. It is unnecessary to point out that the measurement of the electrical resistance of a wire, or the estimation of the amount of iron in green vitriol, is of little use to the majority of the girls, and could with advantage be replaced by courses in domestic economy, hygiene, and other subjects more suitable for women, such as those specified in the Board's special course for women.'

Character of Teaching.

"As regards the character of the teaching, both in evening and secondary schools, I fully endorse the following report of Mr. Crofts :—

"'The teaching of science throughout the district has improved. There is less of the mere reproduction of a text-book, and the experiments shown to a class are performed more intelligently. Arrangements for practical work are more general, but there is a growing tendency, owing no doubt to the pressure of work, to provide the students with the apparatus for the various experiments already set up. This should be strongly discouraged, and the student taught to set up and occasionally make the simpler forms of apparatus for himself. In fact, the practical work should supply to some degree a form of manual instruction. Moreover, printed cards are frequently supplied to the students on which the results to be expected from an experiment are tabulated ; the latter are often transferred *verbatim* to the notebook, and the intended training in observation and deduction thereby materially impaired. Such work is obviously of no educational value.'"

Mr. Edwards' remarks on secondary schools in the three counties, Cornwall, Devon, and Somerset, are as follows :—

"The increase in the provision of secondary education in these three counties during that time cannot be said to be more than slight. It is to be hoped that with their new powers the Local Authorities will see their way to making considerable additions and improvements in various directions, but especially in that of secondary work. It will be most convenient to discuss each county separately—the units or counties making up the Board of Education Inspectors' district being practically quite independent in every way.

"Taking Somerset first, we find that during the present session there are 19 schools having day classes and 11 secondary day schools. All of the last are Division A schools, with two exceptions, where the "B" scheme has been adopted. The day classes, 19 in number, consist roughly of Science and Art Classes held in Grammar and other secondary schools, and of pupil teachers' classes held in secondary or other schools, as a rule on Saturday mornings

"There are secondary day schools recognized for the purpose of grants by the Board of Education at the following places :—Blackford, Bridgwater, Bruton, Crewkerne, Ilminster, Langport, Shepton Mallet, Taunton, Wellington, and Wells. There is also a very flourishing secondary day school at Bath.

"Wells and Langport have adopted Division B scheme, the rest are Division A schools.

"Most of these schools are undoubtedly efficient both as regards buildings and equipment and teaching power. The science subjects are well taught, but it is difficult to make the same statement with regard to English and other literary work. The time-tables are distinctly overloaded with science in several cases and insufficient attention is given to languages, history, and geography. 'English literature,' where it is put down on the time-table, generally means that a play of Shakespeare is taken, and it is sometimes paraphrased in a dull, leaden manner from beginning to end—notes perhaps being taken as to the meanings of certain words and sentences—a proceeding calculated to give the children a strong dislike to Shakespeare or any other author.

"The distribution of secondary schools, though not in as chaotic a state as in some counties, is not altogether satisfactory. There is some chance perhaps at a future time of having a well-organized and thought-out plan of distribution, but short of some public body being given absolute power to close or move schools, there can be very little done for many years.

"Most of the county is well supplied with secondary schools within easy reach of all the more thickly populated districts, but two, if not three parts appear to be in need of some secondary education—they are Watchet, Radstock, and Frome. It might also be worth while to enquire into whether a school might not prove its need by being placed at Yatton.

"Of the secondary day schools three are trying the scheme for 'rural schools.' The experiment is an interesting one, but at present I am unable to report that either the parents, the teachers, or the children are really very enthusiastic about it. It is, however, early days even now to condemn it, for the reason that it has not been tried long enough, and that perhaps those concerned in the conduct of it have not yet hit on the most effective way of working. From the theoretical point of view the scheme ought to be a most rational system, but it is by no means certain that boys who live in the country take a more intelligent interest in things appertaining to the country than the town boys. Also, as a matter of fact, I am informed that very few boys who attend these rural schools have the slightest intention of becoming farmers or remaining necessarily in the country.

"In Devonshire there are seventeen schools recognized under the regulations for day classes. Besides these there are several schools on the list as secondary day schools. They are the Grammar Schools at Totnes, Ashburton, Kingsbridge, Crediton, and the Devon County School at West Buckland. Two or three more secondary schools have quite lately applied for recognition under Division A or Division B of the day school regulations. There is a secondary day school at Plymouth held partly in the Regent Street School and partly in the Municipal Technical School. It is doing effective work. As is generally the case, most of the evening schools are held in day elementary schoolrooms, and the favourite subjects taken are reading, writing, and arithmetic, needlework and cookery, and wood-carving. The classes held in day schools (*i.e.*, not under secondary day school schemes) include technical institutes, some five secondary schools, and one or two elementary schools with ex-standard scholars.

"The few technical institutes which are found in some of the chief towns of the county vary considerably in the character and usefulness of the work they do. It is to be feared that several are in a very languishing state, and it is doubtful if they are really worth continuing. The reason is not difficult to find—it is simply that the people of the West of England are still many years behind the midland and the northern counties in their ideas as to education. The warmer climate makes them generally more easy-going,

and they have not got the incentive to improvement which commercial competition is found to give further north. Ambition to improve themselves either mentally or financially seems to be dormant among the class that form the bulk of the population.

"In any future scheme that may be brought forward it will be one of the most urgent calls to provide good secondary schools with low fees at Barnstable, Tiverton, and Newton Abbot. It is also to be hoped that the several small moribund schools in the county which are totally unnecessary will not be encouraged or bolstered up. There is great need for good secondary schools for girls at several of the towns in the county. In some of these places there are, apparently, from the more or less indirect accounts than one hears, more or less efficient private schools. Where possible it would seem reasonable to try and make some arrangement with the proprietors of these establishments by which they can—teaching staff, children, and sometimes buildings—be used as a nucleus for something larger and perhaps more up to date. A difficulty with regard to a few well appointed and highly efficient schools both in this and other counties is the fact that they are owned by companies which may still receive dividends from any profits there may happen to be. As a matter of fact hardly any of these schools pay any interest at all or ever have done so. Under the circumstances it seems a not unreasonable suggestion to make that the shareholders should formally hand over their interest to the schools, and thus endow them, a body of governors being formed and a scheme being obtained. By this means they will be able to earn government grants which at present they are debarred from doing except in a very small way. The system of 'peripatetic' instruction which is worked in this country proves itself very valuable. It has many advantages to recommend it, the chief being economy and a most decided raising of the standard of the subjects taught. The two subjects which have especially presented themselves to my notice in this respect are French and Cookery, but I have no doubt that others are equally satisfactory. Inspections under section 3 of the Board of Education Act, 1899, have been held in nearly all the endowed secondary schools in the country. An elaborate system of scholarships and exhibitions is in force.

"Comparisons are odious, but they are nevertheless unavoidable. In the case of Cornwall there is no doubt that, so far as secondary education is concerned, the county is very far behind; and yet this may eventually turn out to be not a drawback, but a blessing. Other counties have many wretched little grammar or other schools, which neither provide a decent living for the masters, nor are in the least necessary for the needs of the districts. Some are too close together, and others are situated in the midst of sparsely populated districts and some distance from a railway. Such schools are, and will be, a serious obstacle to any properly organized and distributed system of schools, for vested interests and local sentiment are naturally opposed to the closing of such establishments and are difficult factors to deal with.

"Cornwall will begin its educational campaign with almost a clean sheet so far as endowed secondary schools are concerned. There is, in fact, very little secondary education, apart from technical, in the county.

"To give the same details in Devonshire and Cornwall—there are seven schools having day classes and one secondary day school (Division A) at present recognised by the Board, viz., that at Truro. Besides these, there are the Dunheved College at Launceston, the Truro College at Truro, and the Camelford Grammar School. There are endowed grammar schools at Truro and Fowey, which are at present unconnected with the Board.

"One of the earliest duties of the Local Authority in Cornwall will be to provide a system of secondary education. This will have to be done gradually, but it will not be amiss to point out what are likely to be the best centres for establishing secondary educational facilities. Penzance, Camborne or Redruth, St. Austell, and Liskeard are all places where there is, or ought to be, a need for good secondary schools. They are the centres of somewhat thickly populated districts. The grammar school at Camelford

is not badly situated for serving the northern part of the county. The existing buildings, so far as they go, are good, but they are quite inadequate for what, compared with other places, ought to be, and possibly may be, the needs of the district.

"The secondary day school carried on at the Truro Technical School is doing excellent work, and is gradually increasing in number of students. It is schools of this type which are required in the towns mentioned above.

"The correlation of the work of the mining schools in the county is still under consideration, and various reasons make it inadvisable to discuss the matter further at present.

"The adoption of the system of having county instruction in various subjects would probably be found to be of great use in organizing and encouraging the starting of various schools and classes. The system would also be of use in connection with any secondary schools that may be started. The mining industry induces a large number of miners to attend classes in subjects in connection with their calling, and some excellent work is being accomplished in this respect.

"In the foregoing account of the work done in the district the larger towns have been included in the county, but in future they will have to be considered, as indeed in some cases they are now, as separate districts. The organization of education in the Three Towns will be a matter of some difficulty, and will need careful working out. Exeter and Bath will also have a good deal to do in improving or setting up a good educational ladder. It is to be hoped that it will not be lost sight of that those towns which possess institutions giving the highest training should throw them open, not merely to students from the towns themselves, but, acting in co-operation with the Local Authority of the counties, also to students from the surrounding districts."

The information furnished by Mr. Swain on the position of secondary school work in connection with the Board in Hampshire, Wiltshire, and Dorset complete the detailed review of these counties. Mr. Swain says:—

"During the past year but few secondary schools have been added to the list of those already affiliated to the Board in these counties. The day secondary school at Gosport has grown rapidly and has amply justified the outlay on the present commodious buildings. The usual difficultiess attending the rapid growth of a new school has been successfully sure mounted and a first-rate school of a type much needed in Gosport has received a good start. The new municipal secondary school for boys at Bournemouth is increasing rapidly. It has been open for two years and will now take its proper position in the educational scheme of this county borough. In Wiltshire the County School at Warminster has grown sufficiently to come under Scheme B for secondary day schools. The number of scholars is small at present and the accommodation ample for several years. At Malmesbury the new County School buildings are completed and the scholars are at length located in good class rooms. The building is excellent and the site very well adapted to the needs of the day school. There have been no developments in Dorset during the year in connection with public secondary day schools. In the five towns—Shaftesbury, Gillingham, Sherborne, Wimborne, and Dorchester where a secondary day school is affiliated to the Board under Division A of the regulations there does not seem to be any increasing demand for secondary education for boys. The number of scholars in the secondary schools at Beaminster and Blandford is below that necessary to secure the Government Grant under Scheme B. Paucity of numbers with the attendant difficulties of classification and staffing have made the progress of most of these schools very uncertain. It may be that the experiment of co-education will be tried under the new act, but at present the financial position is not, on the whole, very satisfactory.

"In Wiltshire several of the County Schools have completed their first year under Scheme B and good work is being done. The Bishop's School

at Salisbury has been opened to girls, and a far larger number than it was possible to accommodate applied for admission before the opening day. The Dauntsey Agricultural School at West Lavington is now recognised for grants under Division A for secondary day schools, and the number of students has of late steadily increased. The question of a County secondary school at Marlborough is now occupying the attention of the authorities and progress is being made. The County secondary schools in Wiltshire are mostly of a type more rural than would be met with in more populous centres, but much praise is due to the County Committee for the way in which they have sought to meet local needs in respect of work higher than that of the elementary schools. It has probably been a wiser policy to start schools which should approximate to the higher elementary type rather than to intimate curriculum and methods of the modernized grammar schools of other counties. But the higher elementary school has made no progress in thsse counties. The excellent school of this type at Sandown in the Isle of Wight continues the only one of its class, though it might well be imitated in other centres in this district. The gap between the elementary school, for example, and, say, the girls' public day school, would be well filled in in many cases by the creation of this immediate type of school where the children would leave at a fairly early age, and where the fees would be within the means of the lower middle class population. But here as in most other directions the passing of the new Bill has deterred local authorities from an active policy which might tie the hands of their successors. Towns such as Swindon, Portsmouth, Southampton, and Bournemouth may possibly start schools of the higher elementary type at an early date. In Swindon the question has long been debated and progress has been made towards the erection of the school.

"There have been a few instances in this district of the fusion of a private school with the public secondary school in the same place. These are interesting cases in the development of public authority in education. In some cases the competition of the public school has caused the head of the private school to seek to arrange terms which have been mutually advantageous to both parties. The scholars have been transferred to the public school and the staff retained on definite salaries. This retention of the staff for teaching is not, however, always possible. Age, or lack of qualifications, may prove a hindrance. In such cases it has been possible to continue the private school house as a hostel for boarders for the public day school and the former mistress of the private school has been retained as matron of the hostel. This happy arrangement secures a living to the private headmistress for which increasing years do not disqualify. Where the private school has possessed a number of boarders the transfer of the master or mistress secures the continuance of his or her personal connection among parents for the advantage of the public school, especially if the boarders are retained in the house of the former private teacher.

"It is to be regretted that so many private schools in the larger towns still appear to regard each other as natural enemies. If this sentiment would die down, the secondary school element would be able to present a better front to the local authority and so get their views more adequately considered. There are some signs that local associations of this nature will now spring up. Nor is it unreasonable to suggest in this connection that many private schools might be more efficient if they were to decrease their number by fusion among one another. The difficulties of classification and staffing and the expense of proper equipment for modern methods are keenly felt by the smaller private schools."

It will be noticed in the foregoing remarks that some interesting examples are given of various ways in which the position of good private schools may be to some extent safeguarded and at the same time the development of publicly controlled secondary schools facilitated. It is due to Mr. Swain to mention that the success of these operations has been largely aided by his advice.

Among the many pitfalls that strew the path of an Educational Authority one of not infrequent occurrence is alluded to by Mr Edwardes; he says:—

"A point which is often very obvious is the uselessness and waste of having a separate and small technical institute or building when there is a secondary school in a town. It is much more economical in every way if the grammar or secondary school is used in the evening for the few evening classes which are called for. It means that there is only one set of buildings to keep up and one set of teachers to pay instead of two. In more than one case it will no doubt be possible for the Local Authority to suppress what is generally a white elephant—the local technical institute—transferring the classes to the secondary school of the town."

The local authority has thus to guard against undue or unnecessary competition with any existing secondary schools which are doing really good educational work, to utilise any buildings it may possess or erect to the best advantage, and to realize that as both elementary and secondary education have to be considered all classes of the community must be affected by the arrangements which may be made and the type of educational work which may be undertaken.

I have the honour to be, etc.

C. A. BUCKMASTER.

To the President of the

Board of Education.

GENERAL REPORT *for* 1901 *and* 1902 *by* H. H. HOFFERT, Esq., *one of His Majesty's Chief Inspectors on* SECONDARY SCHOOLS, SCIENCE CLASSES, ART CLASSES, AND EVENING SCHOOLS *in the* EASTERN DIVISION OF ENGLAND, *comprising the* COUNTIES OF NORFOLK, SUFFOLK, CAMBRIDGE, HUNTINGDON, ESSEX, MIDDLESEX, HERTFORD, BUCKINGHAM, BEDFORD, NORTHAMPTON, LEICESTER, WARWICK, STAFFORD, SUSSEX, SURREY, *and a part of* LONDON.

MY LORD,

I have the honour to present a report on the Division under my charge during the two years, 1901 and 1902. In this period considerable changes in the Division have been necessitated by the ever growing work of inspection, and especially by the alterations in the regulations for Evening Schools. A new District has been formed by uniting the counties of Northampton, Bedford, Buckingham, Hertford, and Middlesex, with a small portion of the adjoining County of London. This has been placed in charge of Mr. Westaway, to whose valuable work in the London District I am especially pleased to see this recognition given. The counties of Derby, Nottingham, and Lincoln, under the charge of Mr. Wager, have been withdrawn from my Division, and are now included in the Northern Division; on the other hand the counties of Warwick and Stafford have been added and joined with Leicester to form a District under the charge of Mr. Jones. Other necessary changes have been made in the Districts of Dr. Dufton and Dr. Ball, and Surrey and Sussex have quite recently come under my own charge. Changes.

Owing to the very recent transfer of Mr. Jones to this Division, and the fact that a full report from him was included in the general report for 1902 on the Western Division, I have not included any account of his District in this report, but reserve it for a future occasion. From each of the other Districts I have received reports from which I quote below.

It is very satisfactory to note the evidences which these give of considerable progress in the organisation of higher education in the various counties in the Division, and especially the increasing attention which is being paid to the improvement of Secondary Schools. During the period through which we have been passing of uncertainty as to the exact form which educational legislation Progress in the Counties.

might finally assume, Local Authorities have naturally been unwilling to initiate any new policy or promote any undertakings which might tie the hands of their successors under the new Act, but along the lines of policy already commenced progress has been maintained steadily, and one of the most important of these lines has been that of aiding and, to an increasing extent, of providing Secondary Schools. In this way a large number of new schools has been added to those previously in receipt of grants from the Board, an addition which has been much facilitated by the revised regulations of the Board for Secondary Day Schools, allowing schools a choice between the two schemes of Divisions A and B of the regulations with considerable latitude in the time required to be devoted to science, and in the necessary expenditure thus involved. The less stringent conditions laid down for schools under the B Division have enabled many of the smaller country Grammar Schools, with some aid from the Local Taxation Funds and the prospective grants from the Board, to improve their staff and accommodation in a way which would otherwise have been quite impracticable, and so to reorganise their science work and their whole curriculum on a much more satisfactory basis.

The progress which has thus been made is of good augury for the future when the existing Technical Instruction Committees become merged into the new Local Education Authorities which will have the control of secondary education. All the present indications show that this duty will be undertaken with zeal and energy as soon as the difficulties connected with the transfer of the Elementary Schools to the new Education Authorities are disposed of. Comprehensive schemes for the organisation of secondary education have already been framed for some counties, and their fulfilment only awaits the opportunity and the financial resources to put them into execution. That many troublesome and difficult questions will arise for settlement has long been patent, not the least of these being the financial one. In the country districts schools are as a rule not only greatly in need of funds to enable them to reach a reasonable degree of efficiency, but are often badly placed in respect to modern railway facilities. Motor cars may in the future prove a remedy for this state of things to some extent, but the question of the transfer of endowments from one locality to another is one which will need serious attention, and it is to be hoped that the new Local Authorities will be sufficiently strong to deal with this awkward question.

In the following report by Dr. Dufton on his District, which includes the counties of Norfolk, Suffolk, Cambridge, and Huntingdon, some very interesting facts are given bearing on these points.

Dr. Dufton writes :—

"During the past two years, progress in higher education in this district has been to a considerable extent suspended, awaiting the passing of the

Education Bill. The period of storm and stress in educational politics has had the very important result that education has attained a very different position in the mind of the average person. There is now a stronger and better formed public opinion on matters educational, than two years ago; the people have had a valuable preparation, in the prolonged discussion of the subject, for the increased responsibilities they are to bear.

"In spite of this period of uncertainty and hesitation, there have been some notable developments in this district. Three of the County Councils, Huntingdon, Isle of Ely, and Holland (Lincolnshire), which have hitherto given no direct aid to secondary education, have begun to aid secondary schools. Two completely new secondary schools have been built; a girls' high school at Lynn, and a boys' grammar school at Huntingdon; a new building is nearly complete at Cambridge for the Cambridge and County Boys' School, and a considerable number of additions have been made to existing schools in the form of laboratories and workshops.

"The new Secondary Day School scheme of the Board has met with a remarkable response in the district, and more than half of the public Secondary Schools are following one or other of the two day school schemes. Scheme B, though not so advantageous financially as scheme A, proves very flexible and adaptable to schools of very different types.

"This district is emphatically one of small Secondary Schools, quite a number having from 30 to 60 pupils. Such schools have so far received very inadequate treatment from the distribution of State and Local contributions, in the form of capitation grants, and one of the first duties of the new Local Authorities will be to put their finance upon a satisfactory basis.

"The condition of the schools is so serious, and so little appreciated outside a very limited circle, that I may be allowed to explain it a little fully. Even a small Secondary School of forty boys has children of all ages, from eight to seventeen, and they must, for effective teaching, be divided into at least four groups separately taught. Three assistant masters must then be provided.

"Let us look at the typical balance-sheet of such a school of forty boys, getting all the possible present advantages of county council grants and Board of Education grants, under scheme B. It is as follows:—

Receipts.	£	Expenditure.	£
40 Boys at £6	240	Headmaster	260
County Council	60	First Assistant	120
Board of Education	70	Second Assistant	100
	370	Third Assistant	90
Balance from Endowment, Boarding Profits or Headmaster's Salary	300	Apparatus, Repairs, Cleaning, Firing, Rates, Water, Gas, etc.	100
	£670		£670

"Thus, even with expenditure cut down to the lowest possible limits, there must be an endowment of at least £300 for financial stability, while for a really satisfactory school, at least £200 more would be required. A great number of the schools have, however, very small endowments—less than £100 a year; some have practically nothing, and one 'endowed' school in the district has a considerable 'negative endowment.' The condition of such schools is pitiful. The headmaster and his wife struggle along in continual financial anxiety, sometimes succeeding in attracting a few boarders, and, by clever housekeeping and marketing, making a modest livelihood, but more often having to make ends meet by cutting down the staff, both in quantity and quality, and living with painful economy.

"Probably the best solution of the financial and educational difficulties

of these small, poorly endowed schools, is to open them to girls. In this way the numbers are practically doubled, the fee and grant income rising in like proportion, while very little difference is made in the fixed charges for staff and maintenance. The experience of the fifty-three dual and mixed schools working under the Central Welsh Board, and of the various schools which have adopted the system in England, seems now sufficiently large in extent and duration, and satisfactory in results for counties like those in this district to adopt it without misgiving.

"On the whole there is an adequate number of boys' Secondary Schools in the district for present requirements. Some few are badly placed, and might with advantage be closed or still better transferred to a centre requiring a school, several of which exist. The Secondary Schools of the county of Holland constitute a peculiar and difficult problem. They are all small and too close together for present-day requirements.

"The provision of girls' schools is, however, very inadequate, and unless arrangements are made for girls in the present boys' schools, a good many girls' schools will need to be established. In many cases, existing private girls' schools might be absorbed, by judicious handling, as nuclei for public girls' schools or dual schools.

"We have as yet, in England, no very clear idea as to the number of children who may be expected to attend Secondary Schools. As the County of Cambridge constitutes a rather simple and definite unit, in which the Secondary School system is now practically complete, a few particulars may be of general interest for purposes of comparison. The borough of Cambridge, in and close around which are 50,000 people, occupies the natural and the railway centre of the small county, in which there are about 70,000 inhabitants more. The schools are five in number, two first grade schools (the Perse Grammar Schools for boys and girls); two 'Cambridge and County' schools at a much lower fee, founded some two years ago; and, in an outlying part of the county, Soham Grammar School. The two new schools are, as yet, temporarily housed. The schools have altogether about 350 boys and 300 girls in attendance, which is at the rate of 5·5 per thousand of the population.

"In the counties of Hunts and Isle of Ely, where there are no public girls' schools, the proportion of boys in Public Secondary Schools is about 3 per thousand of the population. In Norfolk, including Norwich and Yarmouth, the proportion is also 3 per thousand, including girls, which seems to indicate that a better administration of the schools should meet with a gratifying response in an increased number of scholars.

"The evening schools of the District continue, on the whole, to prosper. The organization of these is, in most counties of the district, pretty complete, and no very serious change will be required in the local arrangements by the new conditions arising. No doubt in course of time there will be more definiteness and purpose in the aim of these schools than at present, but on the whole, taking the conditions as they are, the work done in the evening schools is in the highest degree creditable."

Turning now to the report of Mr. Westaway on the counties of Middlesex, Bucks, Herts, Beds, and Northants, there is again very gratifying evidence of progress, although the differences in the degree of success in the organisation of Secondary and Technical Education in these five counties are very marked.

Mr. Westaway reports:—

"The time that has elapsed since I took charge of this District has been scarcely sufficient to enable me to make even a preliminary survey of the educational field. It is, therefore, scarcely possible to do more than give a few general impressions of the work in progress.

"In *Middlesex*, great strides have been made by the Clause VII. Authority during the past few years. There has always been a tendency for the Secondary Schools, and the Evening Polytechnics of London, to drain the great urban centres of Middlesex of the best students; but the several Secondary Schools—some of them just established, others re-organised—on the one hand, and the series of Central Institutions for evening work on the other, which are now working under the control of the Middlesex County Authority, are rapidly winning for themselves great popularity. Close to the London border, there is an inner fringe of densely populated urban districts: Tottenham on the N.E., Hornsey on the N., Willesden on the N.W., and Acton and Chiswick on the W. With the exception of Hornsey, there is now a flourishing Polytechnic in each of these centres. (It is to be regretted that Hornsey and Ealing have allowed themselves to be so far outstripped by several of their younger rivals.) Each centre also contains one or more Secondary Day Schools or a projected Secondary Day School. Beyond this inner fringe is an outer fringe of eight or nine somewhat smaller centres of population. In each of these a Central Institution for evening work has been established, and in several of them there is now a Secondary Day School. Many of the evening institutions are in the hands of District Committees, and organic connection between the larger centres and the smaller outlying schools is maintained. Practically, therefore, for evening work, the greater part of the county is mapped out into districts, each district containing a Central Institution for advanced work, and a number of Evening Continuation Schools acting as feeders. A great deal remains to be done before the scheme, as a whole, is in proper working order, but even now one notices a great advance over anything that has been done in London. Nearly all the Evening Schools are under the control of the County Committee; there is no conflict of authority, and little overlapping; the organization shows unity of design, and natural development and organic connection are provided for.

"County Day Schools have been established at Finchley and Tottenham; others are about to be provided at Acton and Edmonton. The grammar schools at Enfield, Hampton, Harrow, Isleworth, and Tottenham are now working under the Board's regulations for Secondary Day Schools; so also are the Stationers' School at Hornsey, and the Brondesbury and Kilburn High School for Girls. The progress that has already been made in Secondary Education in the county is most gratifying.

"The striking features about the work in *Buckinghamshire* is the rapid increase during the past three or four years in the number of Evening Schools. The organization of Evening Schools was taken seriously in hand by the County Council only some four years ago, and the success which has already been gained is in many ways remarkable. The county is one of the most difficult in the country to organise. With an area of 750 square miles, its total population is less than that of Portsmouth. Aylesbury, the county town, contains less than 10,000 inhabitants. Railway communication in the county is poor, and central institutions for evening work are almost impossible—though it is hardly creditable to Aylesbury, that its few small technical classes are housed in no less than four different buildings.

"The organization of Secondary Education is now being taken in hand, and this seems to present great difficulty. The few existing small grammar schools in the county are badly equipped, their endowments are extremely low, and the Local Authorities do not in all cases appear to be very responsive to the efforts of the County Council to provide for Secondary Education. It would seem that for purely Secondary Education, the total yearly income from endowments in this county is under £900.

"In July, 1902, there were only 321 pupils on the registers of the various Public Secondary Schools of the County, viz., the Amersham, Aylesbury, Buckingham, Wycombe, and Marlow Grammar Schools, and the Wycombe and Wolverton County Schools. All these schools are at present very small, but the County Council have assigned building grants to Amersham, Buckingham, Wycombe, and Marlow, and extensions (to include laboratory accom-

modation) are either in progress or are under consideration. Aylesbury Grammar School is to be rebuilt, and a new Secondary and Technical School is to be erected at Slough. The County Schools at Wycombe (girls) and at Wolverton (boys and girls) are for the present established in the Science and Art Institutions of these places. The original proposals of the County Council to establish County Schools in these towns appear to have been somewhat coldly received by both Local Authorities. At Wolverton, this was probably due to the fact that the majority of the pupils come from towns and villages outside the Urban District area. Under the new Act, the County Council will be able to deal with Secondary Education much more comprehensively and completely. To organise the work successfully, however, will be a task of very considerable magnitude.

"In regard to *Hertfordshire*, Evening Schools have been established systematically throughout the county, but there is little advanced work of any kind attempted, even in the larger towns. There is no large central institution, working on the lines of a Polytechnic, in the county. The most unsatisfactory feature about the evening work is the want of co-ordination amongst the different classes. In a small town like St. Albans there are classes at four different schools; at Hitchin, the Evening Classes, all working under the same committee, are housed in as many as six (or seven) different buildings; and so on. The classes are mere isolated units; there is no responsible controlling power, and no educational atmosphere in the true sense of the term. It is quite true that many of the classes are doing excellent work so far as they go, but the curriculum is, as a rule, very narrow, its constituent parts are not correlated, and there is no definite goal placed before the students.

"No scheme for developing Secondary Education in the county appears to have been drawn up, and, so far as I am aware, no new school has been established by the county authority. In addition to the old-established Secondary Day Schools (Division A) at Berkhamsted and Watford (boys), Division B schools have now been established at the Hertford, Hitchin, Stevenage, St. Albans, and Watford (girls) Grammar Schools.

"The pending resignation of the headmaster of Ware Grammar School recently led to a suggestion by a lady member of the County Committee that the Boys' Grammar Schools at Hertford and Ware (towns only two or three miles apart) should be amalgamated. Each of these schools tends to starve the other to death; the two are not wanted; there are only just enough boys for one. It was suggested that all the boys might come to Hertford, and a Girls' High School be established at Ware. The suggestion is an excellent one, and may be usefully considered by the new authority.

"In *Bedfordshire*, Secondary and Technical Education is largely concentrated at Bedford. The work on the technical side is relatively of little importance; the largest classes are at Bedford and Luton. Evening classes in the small towns and villages are largely controlled by the County Authority, and the work appears to be well organized.

"The Secondary Schools at Bedford seem to have had a good reputation in the past. The endowment (the Harpur Trust) is a very rich one, and the schools are financially well off. A new headmaster was recently appointed at the Modern School, and the present headmaster of the Grammar school has just retired. Considerable developments may be expected during the next few years, but hitherto the County Authority does not appear to have given much attention to Secondary Education.

"The only 'Secondary Day School' in the county is the Modern School (Bedford).

"There has been no recognised authority under Clause VII. in Northamptonshire, and the general want of organization, control and guidance is very marked. The County School at Northampton, at which the evening technical classes are also held, is about to be extended, new laboratory accommodation provided, and a hostel built. It is not creditable to a town of 90,000 inhabitants that this school—*the* school of the town—was not rebuilt

many years ago; the laboratory which has hitherto done duty for Practical Chemistry is probably one of the most antiquated in the country. New buildings for technical classes are being erected at Peterborough, the old room in the Cathedral precincts being most unsatisfactory. At Kettering an attempt is made to teach several subjects of experimental science, but there is no laboratory accommodation of any kind in the town. The most serious work in Science is at Wellingborough, where a small but efficient Technical Institute has been built.

"Secondary Day Schools under the Board's regulations have been established at the King's School, and at the Deacon's School, Peterborough, at Magdalen College School, Brackley, and at the County School, Northampton. There are also large grammar schools at Wellingborough and Oundle, but at present I have little knowledge of them."[1]

The District for which Dr. Ball is at present responsible includes the county of Essex and the Eastern half of the Metropolis. From Dr. Ball's report I quote the following account of the progress which has been made in the County of Essex and the adjoining County Borough of West Ham. The London part of Dr. Ball's district I have myself dealt with later in this report.

" In the County of Essex, very great attention has been paid to Secondary Education, and it has been the aim of the Technical Committee of the County Council to establish central Secondary Schools for the various sections of the county, or to equip existing schools suitably. There still remains much to be done in this direction, but a good commencement has already been made. There is now a number of Day Secondary Schools of various types in the county. Quite recently, large buildings were opened at Southend in the place of those formerly used as a Technical School. This is now the finest building of its kind in the county, with the exception of that at West Ham. Additional buildings have been completed, or are proposed for a number of other Secondary Schools. These include the Grammar School at Earls Colne, which, thanks to private bounty and to considerable financial assistance from the County Council, is likely to develop into a most important school. In the neighbourhood of London, the Day Secondary Schools at Leyton and Walthamstow have done much good work, and the Carpenters' Company's School at Stratford has shown considerable improvement. That at Hoe Street, Walthamstow, which not long ago was in an unsatisfactory condition, has now been converted into a very flourishing school. Considerable improvements in accommodation and equipment have been recently made at this school, and more are contemplated. New buildings are proposed for the Sir Antony Browne's School at Brentwood, and it is hoped to effect a similar change soon in the case of the Grammar School at Maldon. The Countess of Warwick's School at Dunmow has had new workshops, a dairy, &c. added to it, and, indeed, most of the schools have been improved to a greater or less extent in a similar way. New buildings for technical work are proposed at Chelmsford, and it is to be hoped that under coming conditions, Colchester may receive similar attention. There is still a very great need for additional girls' schools in the county. At present only two such schools are under official supervision—at Grays and at Walthamstow. It is to be desired that before long others will be established or brought under supervision in the Colchester district and elsewhere in central parts of the county. One such has been proposed for Braintree.

" A large Higher Elementary School has been erected at Ilford, and a very good beginning has been made at this school.

" By means of the free use of staff instructors, classes in a variety of useful subjects have been organised throughout the county by the Technical Education Committee, and generally Technical and Secondary Education in Essex has been thoroughly well dealt with by the County Authority."[1]

The counties of Surrey and Sussex were until quite recently under the charge of Mr. Swain, who has furnished me with the following report on the progress which has been made. My own association with these counties is of too recent a date to enable me to add anything of value at present to his remarks.

Mr. Swain writes:—

"There is not much new to record in the development of secondary and higher elementary education in the counties of Surrey and Sussex during the past two years.

"In Surrey several Secondary Schools have now completed their first year as affiliated to the Board of Education under Scheme B for Secondary Day Schools. Among these may be mentioned:—Croydon, St. Columba's Convent School; Kingston, Grammar School; Kingston, Tiffin's Girls' School; Guildford, Grammar School; Dorking, High School for Boys; Reigate, Grammar School.

"The freedom which this scheme allows makes such a partial affiliation very simple, and in each case I have found the schools anxious to march with the times and to adopt the best methods in teaching the various subjects of their curricula. The depletion of endowments, through decrease in agricultural values, has probably been in most cases the principal motive in seeking the help which the Board of Education afford under this scheme. But there does not as yet appear to be either the wish or the ability on the part of parents to pay the cost that higher education necessarily involves. In the majority of cases the parents are ignorant of the cost as well as uninformed as to how it is met. In most cases, too, the position of the school with regard to the Board of Education is omitted in the prospectus, perhaps with the thought that it involves some loss of prestige or that it is undignified to call attention to sources of income. But I have every reason to believe that increasing contact with the staff of the Board will modify or obliterate this sentiment, and that schools will find the advantage of friendly intercourse and inspection from those who are in close touch with school life and work in the country generally.

"In Sussex, outside the county boroughs, there is little to record. The long-discussed reorganisation of the Midhurst Grammar School is now proceeding, and plans for additional buildings have been approved. The only school outside the large towns in full affiliation to the Board is the Horsham Grammar School, where the work has long continued to be excellent. In the large towns the Eastbourne Municipal Secondary School has completed a year under scheme B. The erection of permanent buildings at Eastbourne proceeds with the tardiness that is so often the characteristic of municipal schemes. The Grammar School at Hastings has had a complete year with its new laboratory and lecture room, and is now affiliated to the Board as a Secondary Day School B. The new laboratory at the Brighton Grammar School has been a great gain. The position of public Secondary Schools in Brighton leaves much to be adjusted and co-ordinated under the new Act, and the imminence of this adjustment has necessarily deterred the authorities in the various schools from adopting any scheme or developing in any direction which might be at variance with the general policy of the county borough in the future.

"With regard to public High Schools for Girls in these counties, the general position remains the same as in previous years. In no case has it been found possible to come under the Board's Scheme B for Secondary Day Schools, though on financial grounds, if on no other, some of these schools would welcome such a connection. In these schools the work in science proceeds on no stereotyped plan, but varies in each case according to the influences that are brought to bear on this side of the curriculum. The value of practical

laboratory work is not yet fully appreciated nor, in the absence of proper laboratories, is it possible to secure the educational advantages of acquiring manipulative skill.

"The experiment of co-education in public Secondary Schools has not been tried in either of these counties, and it is probable that where it is being carried out in other counties in the South, the reasons are financial and economic rather than educational. The question of co-education in the new Municipal Secondary School at Eastbourne is now under consideration.

"No school of the type known as 'higher elementary' exists in Surrey or Sussex, though it is probable that in some of the towns there is a need of this type, especially for girls. The fees of the Girls' Public Schools are prohibitive for many parents who would take advantage of a school which carried the scholars beyond the attainments of the ordinary elementary school, and which by low fees placed a fair education within their reach. It is quite possible that in standing aloof from the Local Authorities, the Girls' Public Schools are courting competition in this direction.

"Much discussion has taken place at Brighton in connection with the transfer of the evening classes from the School Board to the Local Authority, but it is evident that sentiment has been a very large factor in the acrimonious dissensions that have ensued. Statistics have been quoted in ways that do not readily reveal the truth to the unprejudiced enquirer, and at all events it can be said that under the new management it is quite possible for every student to obtain the same tuition as he did under the School Board, and at the same fee. The valuable evening classes that have been developed during so many years at the Higher Grade School in York Place were very much woven into the educational life of Brighton, and the alterations and conditions in this school, which the Borough Council thought well to impose, roused a good deal of feeling among those who had laboured long and who had given up time and money for many years to make these classes a success."

London.

I propose now to give some consideration to the more special problems presented by the existing conditions of secondary and technical education in London, which have come more directly under my own observation during the past two years, for a portion of which period I was in charge of a district which included the greater part of the Metropolis, east of a line drawn roughly north and south through Charing Cross.

Secondary Schools.

Within this area are included about a dozen secondary day schools in receipt of grants from the Board. The number of these schools in Division A. (formerly schools of science) has not shown any material increase for some years. An addition was made in the opening of a new day school at the Northern Polytechnic Institute; on the other hand the Central Foundation School for Girls, formerly a school of science, has become a Division B School, with some advantage from the greater freedom of organisation thus obtained, whilst the loss of grant will probably not be very material since more of the pupils can be included in the courses of science work under the B scheme. The number of B Division Schools has also received an increase in the accession of the Whitechapel Foundation School, the Mary Datchelor School for Girls, and more recently the Camden School for Girls.

The supply of Public Secondary Schools in London certainly seems to be inadequate at present, and of those schools which exist many appear to be badly situated. It is anomalous for

example that boys should be drawn from the north-eastern suburban districts to a school situated, as is the Central Foundation School for Boys, in a crowded business quarter of the City. Very few boys from the immediate neighbourhood are in attendance, and it is a matter for consideration whether this school and others, such as the Owen's Foundation School at Islington, would not be much better removed to the outlying areas from which their pupils are mainly derived.

Higher Elementary Schools.

The needs of the more central areas have been chiefly met, so far, by the so-called "Higher Grade" Schools under the London School Board, which have provided a type of education suited to boys entering business life at the age of fifteen or sixteen years. Of these schools there is a very large number, but only a few of them have been in the past in receipt of the special grants of the Board to Schools of Science, and very few have as yet been converted into Higher Elementary Schools. The former Schools of Science at Blackheath Road, Greenwich, and Bloomfield Road, Plumstead, are now working successfully as Higher Elementary Schools, and the Higher Grade School at Thomas Street, Limehouse, which was once a School of Science, but had found difficulty in retaining pupils for the advanced courses, is now also successfully reorganised as a Higher Elementary School. Other schools of this type have been opened at Clapton, Millfields Road Higher Grade School, and at the Montem Street Higher Grade School in Tollington Park. The School of Science formerly existing at the Burghley Road Higher Grade School, although working very efficiently, has returned to the condition of an ordinary Elementary School on account of the difficulty of meeting the requirements of the Board as to buildings. The School of Science shared with the Pupil Teachers' School a block quite separate from the ordinary Elementary School. This was sufficient for the small number of pupils in the School of Science, but not for the much larger number of pupils which would be included in the Higher Elementary School. There was a proposal to remove the Pupil Teachers' School, and devote the whole of the block to the Higher Elementary School. It may be possible to do this in the future, and it seems to be a desirable end to accomplish. Schools of the Higher Elementary type might very profitably be distributed at suitable intervals over London. They appear destined to fill an important place in any future organised scheme of elementary and secondary education, and to form the natural completion of the elementary system. They should not, and in my opinion do not, enter into rivalry with Secondary Schools, but provide for the needs of pupils who will complete their education at the age of fifteen and then go out into active industrial or commercial occupations. The age at which the choice of entering a Higher Elementary School has to be exercised is also the age at which pupils should be transferred from the Elementary to the Secondary Schools, if the transfer is to be of real and lasting benefit. The natural continuation of the

Higher Elementary Schools is to be found in the Evening Schools and Polytechnics, to which it may be hoped they will in time bring a very desirable and well-grounded class of students, better able to profit by the advanced instruction there given than are, unfortunately, so many of those who now attend the Evening Schools.

If this is to be accomplished, however, the special character of these schools will need to be more fully recognised, and they must meet with more sympathetic treatment from the Local Education Authority. It is desirable that they should be organised as central schools to which are drafted from the surrounding Elementary Schools such pupils as show at the age of ten or eleven years the ability to profit by the special instruction given in them, and are able to stay at school three or four years beyond this age, but are not suitable for transference to Secondary Schools. In the Higher Elementary Schools in London this recognition has not yet been given, little distinction has been made by the School Board between them and the Higher Grade Schools, and they have been mainly filled by upward promotion from the Elementary Schools to which they are more directly attached. Such examinations as have been held for the purpose of obtaining a supply of suitable pupils from the contributory schools in the neighbourhood have not been of a suitable kind, being open to pupils too old or in standards too high to be suitable for entry into the first year's course in a Higher Elementary School. This has, however, been remedied to some extent by more recent regulations for these examinations.

The establishment of these schools is of too recent a date to enable any precise estimate to be formed of their success or of the suitability of the curriculum provided in them. So far, however, as can be seen at present the insistence on practical work in the laboratory as an essential feature of each year's course is being justified by the results already appearing in the greater intelligence, self reliance, and interest shown by the pupils in their school work. In one school at least, advantage has been taken of the reorganisation of the school, to attempt to carry out a very complete scheme of correlation of all the subjects of instruction, and to make the practical work done by the pupils themselves the basis of the work done, not only in science but also in mathematics, geometry, drawing, and geography, and in this way to extend its influence throughout the curriculum. To do this successfully needs of course considerable care, thought, and enthusiasm on the part of the teaching staff, who must act in co-operation under the general guidance of the headmaster or head teacher of science. That this enthusiasm will be forthcoming may be confidently anticipated from the eagerness which teachers have shown of late years to meet and discuss educational questions, and especially syllabuses of instruction, and revised methods of teaching; whilst

the more sympathetic attitude of examining authorities is doing much to set the teachers free to carry out these revised methods in their schools.

The mistake made in some schools, somewhat naturally to be expected at first, has been to attempt with pupils of ten or eleven years of age the same kind of practical instruction which had previously been given to pupils of twelve or thirteen years of age. It has not yet been fully realised by many teachers, and still less by parents and the general public, that the object of insisting on the introduction of practical work in science into the curriculum of these schools is not so much the desire to impart a technical knowledge of physics and chemistry, great though the value of this may be under the conditions of modern industrial life, as to give a more practical and original tendency to the whole of the pupil's studies, teaching him that knowledge is not solely to be got from books, but may be acquired at first hand, giving him interest in manual occupations and in the productions of his own skill and inventiveness, and training him in habits of accuracy, resourcefulness, and a practical way of looking at things which will stand him in good stead in after life. To effect this much more depends upon the methods employed than upon the actual syllabuses followed, and the keen interest which teachers are now taking in the discussion of these methods gives good hope for the early attainment of the desired results.

The position of these Higher Elementary Schools in the educational system of London, and their relation to the Elementary Schools on the one hand and the Secondary Schools on the other, is a matter which will no doubt have the early attention of the new Local Education Authority which is about to be constituted.

Pupil Teacher Schools.

Another question which will also come up for early settlement is that of the Pupil Teachers' Schools. Whilst these schools have done some admirable work in the training of pupil-teachers under more systematic conditions and concentrated effort than was possible in the Elementary Schools, they have not been very satisfactory from the point of view of science instruction. Miss Walter, who has given considerable attention to this question during the past year or two, and has frequently visited all or nearly all of these schools in London, as well as many others in various parts of the country, thus sums up her impressions of their science work :—

"With regard to the Science in the Pupil Teachers' Centres, the scheme of work could be well arranged in each of them to form a progressive and educational course for the four or five years of the students' attendance. This, however, is not always done, and Science subjects are frequently taken in faulty order. This often leads to much repetition and overlapping, the same facts and experiments constantly recurring in succeeding years.

"In spite of the fact that all the students except, in some instances, the probationers, attend only half time or less at the centre, and that the pressure of many subjects is continually felt, there is a frequent tendency to take many different Science subjects rather than to study a few more thoroughly and systematically.

"There is far too much tendency to make the students work for South Kensington examinations, not because the work is suitable to their requirements but merely to accumulate certificates. One of the evil effects of this is that the students' notes are almost invariably dictated, and one finds young people of seventeen and upwards quite unable to rely upon their own efforts in reporting a lesson because they have never been trained to do so.

"There has been a distinct improvement in the matter of experimental work, many of the centres having introduced it into the curriculum for at least a year or two. There is however, still room for improvement in this direction.

"Little effort has yet been made to encourage originality in experimental work, and in some cases cleanliness and neatness in the use of apparatus have been unfortunately neglected.

"It is a matter for regret that suitable laboratories do not yet exist in all the centres. Several of those in existence are inconvenient, and the inconvenience is frequently unnecessarily intensified, owing to extensive arrangements being made to suit the needs of some possible small class of advanced evening students, rather than the constant requirements of the pupil-teachers."

It is very questionable whether the present method of conducting these Pupil Teachers' Schools is the best for the special purpose in view, and there is much to urge for the opinion which is daily increasing that it would tend to correct some of the narrowing influences at present surrounding the training of elementary teachers if the pupil-teachers were made to spend two or three years of study in a good secondary school before taking up their more purely professional training. In some of the large towns in the North of England the School Boards have, with great advantage, made use of their Secondary Day Schools for this purpose, giving Candidates who had taken a three years' course of instruction at these schools special preference and a reduced period of service as pupil-teachers. Some such scheme will be much more easily arranged when Elementary Schools, Pupil Teachers' Schools, and Secondary Schools all come under one authority.

Evening Schools.

The work in the London Polytechnics and large Evening Schools and Colleges continues to develop satisfactorily, and to become more effectively organised. A notable new addition to the list of Polytechnics has been made in the fine building of the Sir John Cass Institute in Aldgate, which is striking out somewhat independent lines of its own. Many of the other institutes are finding their present accommodation unequal to their needs and are making extensive additions to their buildings. It is very satisfactory to note that in these extensions special consideration is being given to improving the facilities for practical work in science and technology.

If an exception is made of the polytechnics and technical colleges and a few schools of special character, such as the Working Men's College in Great Ormond Street, the Morley Memorial College in South London, and the Toynbee Hall in East London, practically all the evening schools in London are conducted by the School Board. The number of these schools is very large, and they present great variety of curriculum from the rudimentary subjects

of the small continuation school to the extensive and ambitious programmes of the so-called "science and art" and "commercial schools" which in the advanced range of their instruction enter into rivalry with the polytechnics. The following detailed report was drawn up by Mr. Westaway, before his transference to Bedford, as the result of a long and intimate acquaintance with these schools which entitles him to speak with special authority on their work.

Mr. Westaway writes:—

"There are two distinct classes of Evening Schools under the School Board, one devoted largely to the training in different subjects of the Board's own teachers—Science and Art Schools; and the other, Evening Continuation Schools proper. The number of students in attendance at one of the former is, as a rule, much greater than at one of the latter. There are also a number of schools known as commercial schools, a few of which are worked in conjunction with the Science and Art Schools. These commercial schools are Evening Continuation Schools of a somewhat more advanced type than the ordinary school, and, as the name indicates, the curriculum is mainly of a commercial character.

"It will be convenient to deal separately with each of the two principal classes of schools named.

"At the Science and Art Schools the majority of the students in attendance are certificated teachers. Except for commercial subjects, comparatively few students other than teachers seem to avail themselves of the opportunities afforded by these schools, which, in fact, appear to have been established by the School Board principally for the training of their teachers in Science, Art, French (and to some extent, German), and Music. Some of the Science classes consist exclusively of teachers.

"The question suggests itself:—Are these classes successful when the specific object for which they are formed, viz., the training of teachers, is considered?

"In regard to Science and Art subjects, a reply in the affirmative cannot be given. Examination successes are, as a rule, considered of primary importance. The training of the teachers in scientific method is, in these classes, scarcely provided for; and Chemistry and Physics, subjects of the highest importance from that point of view, are perhaps the least successfully taught of all subjects, the inadequate time given to the teaching and the pressure of preparation for written examinations quite preventing the lecturers from giving any breadth to their work. One consequence of this is a tendency to reduce to a minimum the necessary experimental demonstration; this defect, always dangerous in any form of Science teaching, is absolutely fatal where the training of teachers is concerned. On a recent occasion a lecturer gave an elementary lesson on the reflection of light, followed immediately afterwards by an advanced lecture on vapour densities and vapour pressures. In neither case was a single piece of apparatus used or even brought into the room. And this was at one of the best of these Science and Art Schools. But the weakest point of this work in Experimental Science is the comparative absence, except in the case of Chemistry, of practical work by the students themselves. There are numerous classes in the different branches of Physics in which the students seldom, if ever, work a single experiment. Yet these students, if they pass the examination in the theoretical side of the subject, will consider themselves as qualified Science teachers.

"Exceptions which deserve notice are to be met with in the Chemistry classes at one or two schools. In one case a valuable course of laboratory instruction has been provided, and in another is to be found inductive teaching of the best kind.

"Undoubtedly the best Science classes are those in Physiology and Botany, especially Physiology. An excellent course of practical instruction in this

subject has been drawn up, and, with certain exceptions, the classes are doing work of a useful character. The Physiology teaching has improved greatly during the past two years. Practical work, however, usually proceeds under difficulties owing to the absence of suitable laboratory accommodation.

"The instruction in Hygiene and Physiography is confined, as a rule, to lectures only.

"There are also several classes in Practical Geometry, Machine Construction, Building Construction, and Mathematics, and a smaller number in Geology and Biology.

"The most successful teaching is to be found in certain classes of a new type which have recently been established by the School Board, exclusively for their teachers. These classes, which are not confined altogether to the Science and Art Schools, are of two kinds, one 'Preparatory Classes in Natural Science' (consisting mainly of Botany and Zoology), and the other 'Preparatory Classes in Experimental Science.' The course of work in progress, while essentially of an elementary character, is designed with the intention of enabling the teachers to acquire sufficient manipulative skill to illustrate experimentally their own teaching in Elementary Science. The teachers may consider themselves fortunate that such classes have been provided for them; for many, especially female teachers, owing to the want of the necessary training, are prone to give 'object lessons' or lessons in Elementary Science without the use of any kind of apparatus. Each course lasts about a year, at the end of which time a certificate is granted to those whose attendance has been satisfactory. This certificate is regarded as a 'qualification' equivalent to an Advanced certificate in a subject of Science. This is all to the good; there is no necessity for cramming, and the work is frequently very well done.

"In regard to the syllabuses for these two courses, that in Experimental Science seems to be quite satisfactory; it might with advantage be extended and a second year's work of a more advanced character taken. That for 'Natural Science' is hardly so good; in the Zoology, for instance, the number of lessons given upon Invertebrates compared with those upon Vertebrates is unduly large; unnecessary stress seems also to be thrown upon one of the sub-kingdoms (Annulosa) of the Invertebrates; and, in one case, a teacher had devoted three or four lessons, or nearly one-twelfth part of the whole of his available time, to a single order (Lepidoptera) of the insects. In general, there is a want of perspective in the teaching of this subject.

"It seems to be of the utmost importance that the men selected for the training of teachers, whether in Science or in other subjects, should be complete masters of their subjects. If teachers are trained by men who are only a step or two in advance of themselves, the ill effects are bound to be felt in the schools of which such teachers have charge. The contrast between the Science teaching at the Polytechnics and that at the Board Schools is very marked. The School Board are, however, gradually securing the services of a small number of well-trained Science teachers. It is of increasing importance that Managers, when appointing a Science teacher, should not be satisfied merely because a candidate holds a particular diploma or certificate; they should satisfy themselves as to the institution where he was trained. A good Science teacher must needs have undergone a long and arduous laboratory training, and preferably under teachers of recognised eminence.

"Somewhat similar remarks apply to the Art teaching in the Science and Art schools. The great object of most of the students is to complete their Elementary Drawing Certificate, or, in some cases, their Art Class Teacher's Certificate, and much of the teaching is subordinated to this purpose. A great deal of the drawing in the day-schools under the School Board is of a very different character, drawing from nature, design, and so forth, entering largely into the most successful work. Hence, much of the teachers' art training in the Science and Art schools is only of indirect benefit to the day schools. At one school, an attempt has been made to break away from the

old lines; the work in progress is of a greatly improved character, but, judging from the diminishing attendance, the change has not been appreciated by the students. It would probably be of great advantage to the day schools if the School Board's Drawing Inspectors could organise special Art classes for teachers somewhat on the same lines as the classes in Experimental and Natural Science. There is now a considerable number of highly qualified Art teachers under the School Board, and the Drawing Inspectors with this teaching power at their command might do much to make the ordinary teachers more efficient in their treatment of drawing in the day schools. One of the most satisfactory features of the existing Art classes is the attention that has been given to black-board drawing; in some cases, this work is of high quality.

"Special French classes have also been formed for teachers. The methods of teaching this subject vary greatly, but, as a rule, one or other of the modern systems is in use. The Gouin system is taught at two of the largest schools, and is meeting with very considerable success. It is scarcely possible to gauge the worth of the Gouin system from the results attained in these two cases. Many of the students in attendance, who for the most part have passed through a Training College, came to the evening schools with a knowledge of the essentials of French grammar, and with some knowledge of French literature—certainly with a fair vocabulary; but, as a rule, the training of the ear and the vocal organs had been imperfect. Hence, the teaching in these classes is, as it were, of a supplementary character, and the Gouin, or some similar system, is exactly what the particular class of students in attendance requires. It is, however, doubtful whether, in a single session, many of the students acquire any great facility in the use of the spoken language, as few appear to devote very much time to practice, beyond the hour or two per week of class instruction. Pronunciation, however, has improved much, and better results in the teaching of French in the day schools may be expected.

"Judging from two or three cases seen, it seems questionable whether an attempt to teach, by the Gouin or some similar system, a language to a class of students knowing, at the outset, nothing of that language, would meet with anything but a qualified success. In the endeavour to eradicate the faults of the older methods, there is a tendency to go to the other extreme. Whilst the advantages of the Gouin system are admittedly many, there are certainly defects of a serious nature. The chief of these, perhaps, is the scant attention paid to literature. Hence, not only is much intellectual pleasure denied to the learner, but he never becomes really intimate with foreign thought; and as only few of the students are ever likely to learn very much of their foreign cousins at first hand, the much to be desired breaking down of insular prejudice is not likely to be greatly helped.

"Amongst the best modern language classes in the evening schools, are two or three of the German classes. In these, excellent use is made of wall pictures, and there is a judicious interweaving of reading, grammar, conversation, and easy comparative philology. English is used as little as possible, even with elementary students.

"At one or two of the most successful classes in vocal music, the students are specially trained for the 'School Teacher's Music Certificate' which is granted by the Tonic Sol-fa College. In these particular cases the teaching is excellent, and the attendance of the classes unusually regular. It seems unfortunate that the standard for this certificate is not higher, some of the requirements being very little beyond those expected of the highest classes in an Elementary School. The time and tune tests are satisfactory, but the ear-tests are too simple, and the modulator practice confined to the first remove. The certificate might well be brought more nearly into line with the matriculation examination of the Tonic Sol-fa College. In its present form, it is secured with too little effort to be of any great value.

"No doubt, the School Board have felt the necessity of affording facilities to their teachers, for obtaining a training in the different subjects mentioned.

The results may be regarded as reasonably satisfactory, as far as French and Music are concerned, doubtful as regards Art, and unsatisfactory as regards Science.

"Until the present Session, all these classes have been free, and the fact that Government grants have been claimed for the instruction given raises a question which cannot be discussed here. But there is no doubt that the teachers are not only able, but would be willing—would generally prefer—to pay for the instruction they receive. A small fee is now charged.

"The fee question leads to the consideration of Evening Schools proper.

"Responsible teachers of these schools seemed, last Session, to be generally of opinion that the abolition of fees was a mistake. But many of them thought that it would be a good plan to make the fees, or at least a portion of them, returnable under certain conditions. They all seemed to say, however, that the imposition of a fee, to begin with, was absolutely necessary if they were to gain any real hold over the students. The average student is naturally inclined to resent any kind of pressure being brought to bear upon him, and will often resent advice, however well-meant and kindly given. He comes and asks to be taught, say, 'fractions'; he does not want to take up a general course of Arithmetic; and, unless his whim is humoured, he will probably go to another school. Yet it is quite possible he will tire of his work in a week or two, and then transfer his attention to Shorthand or some other subject. In some schools, difficulties of this kind are extremely great, and teachers have frequently urged that, if a student had paid a fee he would be more likely to yield to directive influence, and the gain to himself, educationally speaking, would be enormous.

"On several occasions, teachers have remarked that whatever may be said in favour of the question of the non-payment of fees, when regarded as an abstract principle, it must be admitted that in practice it has proved a failure.

"A nominal fee of 1s. per Session is now required of all students over sixteen years of age. I have not yet been able to visit many of the schools since the change and, hence, cannot give any generalised opinion as to the effect of the fee upon the attendance. It would seem, however, that it has prevented the appearance of that troublesome individual of past years who came 'just to see what it was like.' At certain schools, and especially for certain subjects, the fee seems to be inadequate.

"In regard to the various subjects of instruction in the Evening Schools, the least successful classes seem to be those in the different branches of Elementary Science. It is very seldom that these classes are provided with any form of Laboratory instruction; hence, it is scarcely possible to call the work Science teaching in the best sense of the term. Not only this, but facilities for proper experimental work by the teacher at the demonstration table are often wanting. On the other hand, teachers do not always avail themselves of such facilities as are provided. One case may be mentioned where classes both in Chemistry and in Physics are in progress, but no practical work is taken up, although the school possesses a Laboratory.

"Apart from the absence of practical work, the teachers' experimental demonstrations are often—very often—much less valuable than they might be. They are generally 'lectures,' not lessons. In many cases questions are seldom asked, and, in a few instances, never. One teacher admitted that he never thought of questioning his students—they came to be interested; if he placed them in the attitude of discoverers, if he made his teaching inductive, in short, if he 'worried them with questions,' they would stay away altogether.

"One of the most serious mistakes in the Science teaching that is generally made, is the choice of subject. That most commonly taken is Electricity and Magnetism, which is naturally very unsuitable for students with no previous knowledge of Science. The teacher finding himself hampered by the fact that his students know nothing of the fundamental principles of

elementary Physics and Chemistry, tends to fall back on generalities; his teaching becomes inexact, and the giving of information of a more or less scientific character does duty as Science teaching.

"The absolute necessity for interesting the students is constantly urged, as a reason for this particular kind of work.

"It is very possible that visitors are occasionally misled as to the value of the work done. In some schools, the students are encouraged to make at home models of different forms of coils, motors, Leyden jars, electroscopes, &c. All this looks very well, and is good so far as it goes, for a student who has made a piece of apparatus, rough as it probably is, will have gained something. But such students frequently have only the crudest notions of the most simple of the principles underlying the construction of this apparatus.

"I was present at each of two schools in different parts of London, within a fortnight of the beginning of the Session, at both of which the students were almost of the Hooligan type, when a lesson in Chemistry was given. In each case the subject was Hydrogen, and the methods of teaching were almost identical. A blackboard was covered with formulæ and equations, and an old-time discussion on the theory of atoms and molecules, followed in one case by other purely theoretical considerations, occupied at least half the lesson. Both teachers had spent much time in the preparation of their lessons, but the experimental part of the work was made to serve the purpose merely of illustrating facts that had already been told.

"Of course, this is a remnant of the kind of teaching in vogue fifteen or twenty years ago, and it is of the utmost importance that teachers should break away from these old methods. There is, no doubt, a good deal in the contention that the average London youth is wanting in grit, and does not want to learn. But there should be no difficulty in drafting a suitable course of interesting work in Elementary practical Science that should prove attractive even to him. Some form of laboratory is, naturally, absolutely necessary, but this need not be of the old type with its scores of cupboards and drawers, and its hundreds of bottles.

"There are already many laboratories in schools under the London School Board, and it would be of the greatest advantage if all of them were open to the ordinary Evening School students. The Science classes for teachers, as has already been pointed out, are only moderately successful; but if the same centres of instruction were open to the ordinary students, and the work placed on a rational basis, a preliminary training of the best kind might be given them. The Science teachers now in charge of the teachers' classes would, unhampered by examinations, probably do excellent work with the younger students.

"If the worth of the present Science teaching in the Evening Schools be gauged by considering to what extent the students have acquired experimental skill or the power of weighing evidence, or to what extent they are capable of applying their knowledge to solve experimentally some simple problem, then it is to be feared that the value of the work done will be found to be extremely small.

"In regard to the Drawing classes in the Evening Schools, there is a marked contrast with the work done in the Day Schools. Regret has before been expressed that it has not been found possible for the Drawing Inspectors of the School Board to supervise the Evening School work. Some of the Assistant Drawing Inspectors are in charge of Evening Art classes for teachers. If the services of these gentlemen could be secured for general Evening School work, their advice should prove most valuable. Very many of the Art teachers appear to feel the need of direction and guidance. Many of them are highly qualified men, but they lack experience.

"Classes in preliminary Technical Drawing have been established at certain schools. It is to be hoped they will be encouraged, as they are doing most valuable work. The course forms a good introduction to Practical Geometry, Machine Drawing, and Building Construction.

"The numerous French classes are very variable in character. Comparatively few students of those registered in this subject have been regular in their attendance from October to March. The majority seem to have little notion of the very serious work required in order to master a new language. The small amount of work actually done in school, unless supplemented by a much larger amount at home, is productive, necessarily, of only trifling results. The total amount done in six months is generally disappointing, and the question frequently suggests itself whether the small modicum acquired of the language is ever likely to be of much use to the learner. There remains, of course, the possible disciplinary value of the work done, but probably this would have been equally well, if not better, secured in other ways.

"Although, in some cases, methods leave something to be desired, there is much excellent teaching energy absorbed in these French classes, and it is greatly to be regretted that the students are not more responsive to the efforts of their instructors.

"There are a few classes in German, and a small number in Spanish and other languages.

"Writing, composition, and arithmetic are taught in most of the Evening Schools. In the case of arithmetic, collective teaching is often impossible owing to the varying demands of the students. If a class exceeds six or eight students, individual teaching is not likely to be very effective; principles and methods cannot receive much attention.

"Possibly some redistribution of the teaching power in the schools of a given area might lead to better results.

"At certain schools, special classes in Arithmetic and Composition have been formed for policemen. Constables are prepared for the Sergeants' examination and Sergeants for Inspectorships. The men are generally remarkably keen in their work, and the observer is struck by the intelligence shown in some of the written essays. It is said that a large number of Sergeants and not a few Inspectors owe their present position to the training they received in the Evening classes under the School Board.

"Bookkeeping and Shorthand appear to be far more popular and more successful than all the other subjects taught. While it is true that a large number of students join these classes at the beginning of the Session and fall away after a short time, there is, as a rule, a greater proportion whose attendance is regular than in other subjects. The teaching, if judged by results at the Society of Arts and Chamber of Commerce examinations, is very successful. Armed with certificates of proficiency in these subjects, students have little difficulty in securing berths in City offices, and a large number of young girls who have been asked have admitted that that is their primary object in joining the classes.

"Subjects like these, being of a technical rather than of an educational character, are naturally more in place in an Evening than in a Day School. Some teachers are inclined, however, to urge the claims of Shorthand from an educational standpoint on the ground that there is a training in phonetics, an increase of vocabulary, and so on. A much greater gain seems to be the concentration of effort to which a student is compelled if he is to become a successful shorthand writer. In this respect the teaching of Shorthand compares very favourably with the teaching of Elementary Science in the Evening Schools, for, in the latter case, concentrated attention is scarcely demanded of the student at all.

"It is doubtful if all the classes in Commercial Correspondence and Office Routine are of a very practical character. Some of the teachers seem to have very little knowledge of the practical routine of an office. The work thus tends to become unreal, especially when such subjects as shipping orders, bills of lading, etc., are dealt with. Moreover, until the present Session, beyond an occasional letter-file, nothing in the way of equipment seems to have been provided for these classes.

"Lantern lectures usually accompany the Geography teaching. The

sets of slides which are in use are sent to the schools in rotation. The system seems to work well, but the slides are not always well selected. The showing of numerous public buildings in large towns, about which the teacher has no definite information, becomes monotonous, and the lesson loses in value and interest. The lantern lectures are, however, often preceded by carefully prepared lessons. The subject is a favourite one at certain schools.

"It is pleasing to note that English Literature is gaining in popularity in the Evening Schools. The teachers seem to have made up their minds that 'an author writes to be apprehended and not to be analysed.' There is seldom any attempt to teach this subject by placing an annotated text-book in the student's hands, and the minutiæ so often taught—philology, historical and mythological references, etc.—are, as a rule, entirely passed over. That this is the right method in a school where language and history receive separate treatment, there can be little doubt, and there seems to be much to be said in its favour even in Evening Schools. Characterisation receives its full share of attention, and although this sometimes appears to lead too much to hero worship, especially where the teachers are ladies, the students are often obviously impressed with the beauty and the grandeur of the passages read and commented upon. The weak point of the teaching is, as a rule, the failure of the teacher to make any demands on the judgment of his students; he rarely asks questions, rarely invites discussion; no demand is made on the critical faculty. In fact the students' work is too often limited to a passive admiration. Some time ago I was present at a school when a lady teacher, with considerable powers of declamation, gave a special lecture, the subject of which was 'Dante'; as an appeal to the emotions it was a great success, as an appeal to the judgment a failure. However, it is to be hoped that the teaching of Literature will be encouraged. It is a good sign that it is popular, and it ought to be possible to make it a subject of real educational value.

"The Manual Instruction in wood compares unfavourably with the work of the Day Schools. The work is less accurate, and its disciplinary value is sometimes of very small account. Some instructors have great difficulty in getting the students to do the necessary working-drawings. This seems to be no fault of the Instructors themselves, many of whom have done years of excellent work in the Day Schools. The Centres are frequently some distance away from the Evening Schools to which they are attached, and the influence of the responsible teachers is therefore not felt. In some districts this increases the instructors' difficulties materially.

"There is one very successful class in Metal-work, where some creditable work is done at the forge, the lathe, and the vice. The weak point of the many Wood-carving classes is that the students are mere copyists. The work is not associated with classes in design, and is often feeble in consequence. A similar remark applies to the various classes in Repoussé work.

"Most of the Cookery and Laundry classes appear to be in all respects satisfactory. So far as one can judge the syllabuses have been drafted with great care and are of a very practical character. As a rule the students in attendance are of the type likely to be greatly benefited by the work they do at these classes.

"Needlework and Dressmaking are subjects which are taken up by many different grades of students. At a few of the larger schools some of the students who are in attendance for Dressmaking and Millinery are evidently in a position to pay a good fee for their instruction, and there seems to be no reason whatever why they should be admitted at a nominal fee.

"The many classes in First Aid and Home Nursing seem to be very popular and to be doing a useful work.

"In considering the Evening School work as a whole, several questions suggest themselves. Is the training the students receive likely to make them better citizens? Has the work in progress any humanising influence over the rougher elements amongst the students? Are the students trained to think more clearly and to reason more accurately? Do the classes form

a suitable connecting link between the work of the Day School and that of the Polytechnics? Are there any special difficulties which the Managers and teachers encounter in carrying on the work of the Evening Schools?

"The difficulties which arise from the apparently almost incurable apathy of the average London student are unquestionably great, greater than some of the Managers seem to care to admit. The number of students admitted during the present Session (1901–2) will probably be found to be at least equal to that of last year, yet such large numbers are ceasing to attend that it is quite possible that the average attendance will be somewhat lower than in previous Sessions. There seems to be absolutely no valid reason for this continually diminishing attendance, though possibly in some districts the long hours of labour may go far to explain matters. No efforts are spared to keep the students at school; circular letters, post cards, etc., are almost invariably sent to absentees, and everything seems to be done that can be done to prevent the students from falling away. There is not the slightest doubt but that it is the fear of a further diminished attendance that prevents many teachers from working on more soundly educational lines; so many of the students must be humoured, must be interested, or even amused. At some schools periodical social evenings are said to do much towards keeping the students in regular attendance. Many students are no doubt influenced by teachers of strong personality, and an Evening School in London is no place for a teacher who is not full of enthusiasm for his work. The praiseworthy efforts of the responsible teachers to secure good attendance deserve acknowledgment, for it is of primary importance—it is almost a duty to the State—that an apathetic youth should be roused to a sense of his own future.

"The strong personal regard which a Day School boy often feels for his form master is almost out of the question in an Evening School, the change of teacher owing to change of subject, and the comparatively short time together of teacher and student, tending to prevent anything of this kind. But the success of one or two of the most successful schools seems to be due largely to the personal interest taken in individual students by the principal teachers. In fact, a strong and enthusiastic teaching staff seems to ensure a very considerable measure of success to the school. But the enthusiasm is indispensable.

"With the exception, perhaps, of the classes in Physiology, the teachers Science classes might with advantage be abandoned. The laboratory accommodation would then be available for evening students, and a great deal might be done by means of a suitable course in practical Elementary Science towards developing their powers of observation and reasoning. The prevailing mental indolence must needs be overcome by some means, and practical science is probably the best remedy."

One of the main questions which arise for consideration in connection with these Evening Schools is the great need which exists, and which is clearly brought out in the above report of Mr. Westaway, for some more definite delimitation of the work done in them, and for their closer correlation with the polytechnics. There is undoubtedly at present much unnecessary competition and overlapping of the instruction given in the two classes of schools. A great part of the more advanced work, especially in science, done in the Evening Schools under the School Board, might be transferred to the polytechnics to the great advantage of the students, whilst on the other hand much of the very elementary work done in the polytechnics would find a more suitable place in the ordinary Evening Schools. At present the Evening Schools do not serve to any appreciable extent as feeders

to the polytechnics and technical institutes, and now that the latter are themselves becoming more definitely organised, and brought into close relationship with the reconstituted University of London, it is very deisrable that steps should be taken to bring the ordinary Evening Schools into more definite and intimate association with the institutions for more advanced training in the Metropolis, so that they may all become knit together into one well-graded and co-ordinated system.

I have the honour to be, etc.,

H. H. HOFFERT.

To the President of the
Board of Education.

GENERAL REPORT *for the year* 1902, *by* S. J. CARTLIDGE, ESQ., *His Majesty's Chief Inspector of Art Instruction.*

MY LORD,

In submitting my General Report on Art Instruction in England and Wales for the year 1902, I have to state that, whilst a fair degree of progress is maintained in many of the large towns and districts, there are localities in which little headway appears to have been made, and others in which decided retrogression is manifesting itself. I regret also to report that in many Evening Schools a falling off in the quality of the elementary studies is apparent. This latter backward tendency is one of so serious a nature, that, unless checked in time, it may ultimately affect the advanced studies, not only in the quality of the work done, but in the number of students taking them in the future.

The causes of this undesirable condition of things are varied, complex, and in part obscure. But some of them are so obvious that they may reasonably be referred to in this Report.

In the localities which are not going forward, a peculiar species of inertia appears to have set in. This, in some places, has been ascribed to the unsettled state of affairs pending the passing of the Education Bill of 1902. Now that this Bill has become an Act, the indisposition of Governing Bodies to move in such an important matter may pass away under the new Authorities brought into being by the provisions of the Act.

But the general falling off in the quality of elementary work in Evening Schools is largely due to the aim of making the studies as attractive as possible, which appears to absorb the attention of some Governing Bodies. Such an aim is wholesome if combined with the desire and effort to make the classes educative as well as recreative. But, unfortunately, it is the truth that large numbers of young people have attended evening schools for the sole purpose of being amused. To such an extent has the desire of rendering the work agreeable to the pupils been carried, that it is not at all a rare occurrence to find that they are allowed to select, reject, or abandon their tasks at will. This is not only calculated to destroy all sense of respect for whatever the teacher tells them to do or not to do, but it effectually prevents the attainment of any good educational result in either Drawing or other branches of Art. The teacher becomes a mere *surveillant*, and from lack of exercise loses in time all effective teaching power. And it is impossible to estimate the amount of

harm that thus arises from the formation by the students of bad habits of work, which in countless instances will never be eradicated. Another contributory cause of the decline in some branches of Art Education is the inefficient teaching of Drawing in some of the Elementary Schools. There is not the least doubt that whilst there has been remarkable and sustained improvement in some Schools and Districts, in others the study of Drawing has deteriorated during the past few years, and when pupils who have left the Elementary Schools and started their working life wish to follow the study of Art, they come to the Evening Schools ill prepared to take advantage of the excellent instruction to be found in some of them. The cases of such pupils are of course, hopeless, if they go to an inefficient Evening School. Since the examination in Elementary School Drawing was abolished in 1898, the teaching of Drawing has suffered in many localities, and there are Teachers and Managers who are of opinion that the re-establishment of the examination system is the only way to restore efficiency in this direction. Be that as it may, there is a manifest need of active technical supervision of Drawing instruction in many Elementary Schools, and until such supervision is supplied we must be content with much unsatisfactory work. But in every district containing an efficient School of Art, such technical supervision should be easily obtained. The system which has been so successfully followed at Birmingham, Leicester, Burslem, and a few other centres, of exerting the influence of the School of Art upon the Elementary Schools, would, if widely adopted, do much to produce efficiency in Elementary Drawing throughout the whole country. It would, moreover, secure the natural passing on of the pupil with artistic talent to the higher instruction of the School of Art.

Yet another cause lies in the parsimonious policy of some Governing Bodies. Abnormal economy regarding Art instruction in some cases prevents proper equipment. As an instance, it may be stated that until a visit by the Inspector was paid, in one School a class in Blackboard Drawing was being held without blackboards for the students to draw upon. And sometimes an Inspector has found students struggling with their studies in Evening Classes when the light allowed them was not sufficient to enable him to see the writing in his note-book. One case seen in London, is remarkable. In a small, ill ventilated room, some students were working in a space sufficient only for half their number. They were so cramped for room that they could not even see their work properly. The fact that they showed keen interest and zeal in their studies, and that they were students of the artisan class, attending the Evening School after a long day's work in a manufactory, made the case more surprising, in view of the importance of affording every opportunity of efficient education to the industrial worker. Such a case as this provokes comparison with the conditions under which French artisans pursue their studies in Paris, or indeed in any town of importance in France, where, as far as my experience goes, such a state of things is impossible.

Instruction in Drawing in Secondary Schools shows signs of improvement. The course of study is often planned on good lines, the lessons are wisely arranged, and all would go well if sufficient time were given for practice, as is the case in only a few of the better Schools. Fully effective work can be done, and habits of really accurate observation formed, only when a reasonable time is allowed for practice. But there are people still who do not understand the necessity for education in Drawing. An influential Governor of a Boys' School recently told me he considered it inadvisable to teach any boys Drawing except those who have an undoubted gift for it. Knowledge of Drawing lies at the root of all sound work in graphic or constructive Art, just as a knowledge of reading and writing is the indispensable basis of all work in literary Art. But everyone who learns to read or write does not do so with the idea of becoming a poet or a novelist. The power of reading and writing, or of understanding and expressing the meaning of words, is obviously necessary to all who are to know clearly what is going on in the world around them. In the same way a knowledge of Drawing or of understanding the meaning of shapes and appearances is necessary to all who are to know with accuracy the nature of the varied forms which surround them in the world. In fact, Drawing is really the reading and writing of Form, as it includes the correct seeing and true expression of the varied appearances of Form The power of seeing correctly and drawing accurately simple everyday things is obviously essential in the education of boys who are to follow commercial, mechanical or military occupations. If it is allowed to be reasonable to teach boys, as far as we can, the right use of their ears and their tongues, it is just as reasonable that we should also teach them the right use of their eyes. Our Continental and Trans-Atlantic neighbours are doing it, as they are persuaded of its importance in developing the faculties of the individual. Where Schools are under the management of Governors with the views I have quoted, little progress is possible in the matter of Drawing. Secondary Schools.

In a large proportion of Girls' Schools, however, the matter of instruction in Drawing is receiving much attention. Excellent courses of study are followed, and in the majority of cases sufficient time is allowed for practice, save in the more advanced sections of the work, which are really Art studies in Painting, Design, etc.

School premises vary considerably in point of view of their fitness for effective instruction in Drawing. Some Schools have a separate Art Classroom or studio in which all the Drawing instruction is given. Others work partly in a separate Art room and partly in the ordinary classrooms. And a number having no separate room use the ordinary classrooms only, which, in some instances, are badly lighted and ill adapted for the study of Drawing. The equipment varies too. In some of the Girls' Schools it is excellent, and it is good in a few of the best Schools for boys. There are, however, many Schools with poor equipment for the purpose.

In this connection, H.M.I. Mr. Allport reports from the Northern District:—

"In some of the Grammar and other Secondary Schools that I have visited, the Art Work is carried on in rooms specially constructed for and admirably adapted to the purpose; in these Schools the teaching is usually thorough and satisfactory, the curriculum liberal so far as the capacity of the children will admit, and the general standard of the work good; on the other hand in some Schools in which admirable Gymnasia and Science Laboratories have been provided, apparently no attempt has been made to supply Art rooms or to give the Art side of the work the consideration which it deserves as a factor in the general training of observation. It is only just to the teachers in these Schools to state that they usually do their best and sometimes produce fairly good results under adverse conditions.

"Generally the curriculum in Girls' Schools is more varied than in Boys' Schools, but the teaching is not so academic and severe; the boys probably get a better grounding in the drawing of models and common things than the girls, but less memory drawing and nature study.

"The qualifications of the Art teacher are often not what one would desire in a Secondary School; for example if a teacher holding no higher qualifications in Literary and Scientific subjects than those which the "D" Certificate represents in Art were to apply for a post in a Secondary School his application would be considered preposterous, nevertheless the "D" is often considered all that can be reasonably expected in Art. Want of funds is undoubtedly in many cases the reason for this; it is also often impossible to find continuous employment for an Art teacher.

"The desideratum would appear to be an Assistant capable of undertaking some of the ordinary work of the lower forms, having good Art qualifications and of artistic temperament, but teachers of this kind would probably seek a more remunerative post than that of Junior Assistant in a Secondary School."

H.M.I. Mr. FitzRoy reports from the South Eastern District:—

"In Secondary Schools Drawing instruction suffers as a rule from the short time given to it. In many Schools, boys or girls receive only one hour per week, which is quite insufficient to give them thorough training in observation, or to give them power to represent common things easily. As a sound training for commercial life, a boy should be able to sketch any common object quicker than he could describe it in words. More advanced drawing is usually hindered by the lack of a proper room with favourable light and proper equipment. A room devoted to Drawing should have round the walls a series of large photographs of different styles and periods of Architecture, of Architectural Sculpture, and of different styles and periods of decoration. Colour reproductions of tiles and textile fabrics of different periods would also be useful.

"It is most important that facilities for Blackboard Drawing should also be supplied.

"More nature study of flowers and foliage should be taught, and practice in Model Drawing should be directed more to the drawing of common objects."

Mr. Lattimer, South Western District, says:—

"In the Secondary Schools visited by me, instruction is as a rule confined to drawing in outline from the flat and the round. To this is occasionally added Geometrical Drawing, Drawing in Light and Shade, Drawing and Tinting with the brush and colour, Elementary Design, and Painting from simple groups of Still Life.

"Although in some instances no work with instruments was done, and in a few others some of the exercises were either weak in effect or beyond the capacity of the students, the scheme of instruction was as a rule satisfactory and well adapted to the needs of the students.

"As one would naturally expect, the best elementary and most successful advanced work as well as the best type of instruction is found in Schools where the teachers possess high qualifications for the work, where the equipment is good, and special rooms used for the purpose."

Mr. E. H. H. Bruce, South Western District, says:—

"The Art work which came under my notice in Secondary Schools appeared promising; its importance as a factor in the development of education being more and more appreciated, and the considerations as to its organization, both with regard to itself, and its relation to the other work of the Schools, being seriously considered. The value of the figure drawing that is done is limited, owing to a certain amount of prejudice in the provision of antique and anatomical figures, thereby rendering it less sound and more wanting in knowledge of construction and anatomy than it should be.

"Perhaps the most satisfactory part of the work at present is that in the more elementary stages, in which the developemnt of the faculty of ocular observation is aimed at, and before the children begin to use their reasoning powers fully. After the earlier stages the time given is comparatively so short, that beyond a sound understanding of principles and methods of construction and a general knowledge of theory, not much must be expected and a general facile and good technique can scarcely be looked for.

"More consideration is being devoted to the improvement of the Art Premises, and the necessity of providing suitable rooms for the study of Art subjects in new Schools is better appreciated.

"In one School in which the principal aim of the Head Mistress appears to be the gaining of University distinctions, sufficient time for the reasonable study of Art is not given, and so little importance is attached to the study of this subject, that the pupils have to attend for the first part of the period allotted to Art study, at a class for physical exercise, and are allowed to go to the Art Class in a condition in which they are quite incapable of taking advantage of the instruction given during the time that remains.

"In other Schools where the Head Mistresses take a broader view of the uses of education, and where they are in accord with the Art instruction, valuable work is done and is found of great benefit to the pupils and of service to the interests of the Schools."

Training Colleges.

The conditions of instruction in Drawing in Training Colleges remain much the same as before. In all the Colleges Blackboard Drawing is well cared for. In some Colleges little is done beyond Blackboard Drawing, in others a comprehensive study of Drawing obtains, the course of study including careful drawing on paper from common objects and from natural foliage, Brush work, Light and Shade, Elementary Design and Perspective, as well as illustrative exercises in line and colour done in connection with a course of History or Nature lessons. Some of this work is done under difficult conditions as to premises and equipment, which, however, are made as suitable for their purpose as funds will allow. The time allotted for study and practice is generally sufficient, though there are a few Colleges where an undesirable minimum appears to have been reached. But it must be said that even in these cases the time has proved to be sufficient for preparing the students for examination. The qualifications of the teachers vary considerably, but whenever a highly qualified specialist is available as a visiting teacher the Colleges as a rule secure his assistance.

Mr. Allport says:—

"Many of the Training Colleges suffer from indifferent accommodation and equipment although some have good Art rooms and the necessary appliances for the work. The Roman Catholic College at Liverpool has lately built new Art rooms which when furnished will be admirably adapted for the work.

"The teachers are on the whole very painstaking, and carry on the work as well as possible, but they are not always as well qualified to give the instruction as they should be; in some of the Colleges they have thoroughly well qualified and able Art Masters to give the instruction, and it is very desirable that this should obtain universally.

"The curriculum of a Training College is often a great difficulty because of the different attainments of the students and the limitations of the Time Table, which make it almost impossible to give scope enough in the syllabus or to arrange the teaching so as to enable the advanced students to go forward with their studies as they should do."

Mr. FitzRoy says:—

"Drawing instruction in Training Colleges is as a rule satisfactory consisting chiefly of Blackboard Drawing and Nature Study.

"Many Colleges are hampered by not having a room properly equipped for Drawing.

"The Blackboards should be arranged permanently round the walls of the room devoted to drawing; so that the trouble and waste of time in arranging 20 to 30 easels for each lesson would be avoided.

"The importance of Drawing as the right hand and ground work of all teaching in Elementary Schools is now, as a rule, understood.

"In some Colleges, however, the curriculum does not provide that sufficient time should be given to practice in Drawing."

Mr. Lattimer says:—

"I made notes of the syllabuses and students' work at the Bristol Day, Bristol Diocesan, Cardiff, Swansea, Carmarthen and Aberystwith Training Colleges when I visited these Colleges for the purpose of examining the candidates in Drawing with Chalk upon the Blackboard.

"The syllabuses of these Colleges varied slightly, but all included training in Drawing ornamental and naturalistic forms from the flat, Drawing Geometrical Models and common objects from the round, and Drawing from Memory. This work was done with pencil, chalk, and brush and colour. Other subjects which had a place in some of the syllabuses were Geometrical Drawing, Perspective, Map Drawing, the Illustration of Class lessons, Drawing in Light and Shade and Work in Colour. All these subjects have their uses, and there is no reason why different exercises and models should not be used at different places, so long as the object is to teach the students by means of a series of graduated exercises to study the structure and character of things and to represent them accurately and with feeling for their form on a small scale as well as a scale large enough for class purposes. If this object were realised, not only would a teacher be able to represent with success such objects as he could personally examine and make notes of; but seeing that for certain matter he must rely on the drawings of others or photographs, his training would help him to understand those Drawings, etc., which are at best poor substitutes for actual things.

"The time devoted to the work varies from one to five hours per week, two hours being usually given.

"At one College at least, Modelling and Wood-carving are taken by the 1st and 2nd year students respectively."

Schools of Art.

It seems probable that we are at the beginning of a great improvement in regard to Schools of Art. In some places it is now realised that the School of Art has functions and branches of study which are necessary in these stressful days which differ greatly from those of the early Victorian period, when, by the foresight and energy of the late Prince Consort, Schools of Art were established. The typical School of Art of to-day should minister to the educational needs of all classes in the community. It should, in the first place, afford sound instruction in drawing to those (and there are many) whose education in this particular has been neglected. Amongst students of this class in many parts of the country I have seen young, and occasionally old men, of varied occupations, working steadily with a full consciousness of improvement. Until our system of Elementary Education in all parts of the country is more efficient in regard to Drawing, students of this class will be numerous. The School should also teach Drawing as an indispensable basis for Arts and Handicrafts. Every Art-worker and Handicraftsman must have a knowledge of Drawing or his productions will attain comparatively little value. Another function of the Art School is to provide instruction in the language of Form and Colour to those whose purpose it is to become Artists in Painting or Sculpture. The study of Architecture must also be provided for in order that the young Architect may learn how to look at, to analyse, and to understand the beauties of the fine work round about him. And the amateur cannot be ignored, though some people with narrow views advocate the exclusion of the amateur. Much good is done by the School of Art in correcting and removing vicious tendencies in the amateur, and leading him to the study of what is best in Art, thus widening the circle of those who have taste and sympathy with the beautiful work produced by the best artists, who, hitherto, have not been embarrassed by a plethora of admirers and patrons in this country. Then there is the important work of extending the training of Elementary and Secondary School Teachers in Drawing and Art, a work which must, as time goes on, devolve more and more upon the best provincial schools. The steadily increasing demand for works of Art craftsmanship renders it imperative that the embryo Art craftsman shall be educated in the principles of Art, and the Schools of Art in this century will find a considerable part of their work in training capable craftsmen. Unless the craftworker is brought under good Art influence his work will have (however expertly it may be executed) an inferiority in style and character that will prevent its reaching the highest value. And as those with a taste for works of handicraft increase their knowledge, they will demand works of higher merit. Hence it is of importance that our Schools of Art should press forward in this direction, so as to secure the position of the British craftsman among the future Art workers of the world. In manufacturing centres these varied functions will not be allowed to displace or weaken the dominant aim of the School of Art, which, there, is the training of designers for, and workers in

Manufactures. In such localities this aim has never been lost sight of by the Schools of Art, though it has often been pursued from the theoretical side only. In these days the doctrine advocated by those who abominated manufactured or machine-made goods does not hold, as it is clearly demonstrated that manufactures and machinery are here to stay. Not only is the welfare of Art Manufacture an essential factor in the commercial prosperity of the nation, but its development is the chief means of bringing about the permeation of the elements of beauty into the daily lives of the poorest of our fellows. The rich have their precious productions of handicraft. The poor should have their Art productions too, and these can only come to them by the cheaper medium of manufactures, which, as time goes on, will doubtless be brought more and more under the influence of Art. Some progress has been made in this direction as is evidenced by our well printed and illustrated cheap books, inexpensive tasteful wall papers, printed fabrics, tiles, metal work, etc., etc. Then the hygienic aspect of decoration has yet to be systematised as regards study, from the point of view of the influence of Colour and Form upon the temperament and health of the individual.

Handicrafts. Something has been done in these directions, but the most striking feature during the past year in connection with Schools of Art is their activity in forming and developing classes in handicrafts. These include Wood-carving, Embroidery, Wrought Iron Work, Repoussé Metal Work, Enamelling, Wood-staining, Book-binding, Stencilling, Stained Glass, Mosaic, Handmade Lace, Leather Work, etc., etc. Generally the work is well done, but there is a tendency in some localities to allow the craft work to degenerate on the one hand into feebly executed amateurish productions; and on the other into work showing full command of the material, but little or no trace of artistic treatment. Keen and assiduous supervision is required to avoid these defects. The student who has become expert in working material without gaining knowledge in artistic expression, should go through a course of lessons in Modelling, Drawing, or Design having a bearing upon the particular craft followed. House painters' and ornamental plasterers' work is being taken up in some centres, and much valuable work is done in bringing the influence of Art training to bear upon these handicrafts. Stone-carving is studied at a few Schools and would be at many more but for difficulties in finding practical teachers for the classes.

Mr. Allport states:—

"The recent development in the study of such handicrafts as wood-carving, ornamental metal work, embroidery, illuminating and other crafts closely allied to the ordinary work of the Art student is conspicuous in many Schools, and I think there is every indication that both ordinary Art study and handicraft will benefit thereby.

"Classes for practical lithography have been started in some Schools and others are contemplated.

"Enamelling is also receiving attention and furnaces have been fixed in a few places."

Mr. Lattimer says :—

"Students who attend Classes in the artistic crafts may be roughly divided into two classes, those who wish to improve their knowledge of the craft or industry in which they are engaged during the day, and those who have a bent for artistic work and wish to apply themselves more or less seriously to it. The former understand the value of continuous and serious effort, and gain by being raised for the time out of the limitations to their experience imposed by the exigencies of trade. Among the latter there is generally a proportion of students (usually adults) who do not see the value of a well graduated series of allied studies leading eventually to successful work in materials. Sometimes in the same town there are classes (not affiliated to the Board of Education) in the Artistic Crafts, in which it is known that the study of Design will not be insisted on. Under these circumstances it is gratifying to find that the teachers under the Board are often conspicuously successful in inducing students of the crafts to study more than the use of tools and the nature of materials. For instance, the form of plants, modelling, cabinet construction, design, etc., are studied concurrently with the possibilities of the materials.

"I have seen good work done by students who united the study of nature, of composition, and of the best work of the past, with practice in some craft."

Manufactures.

Beyond the education of Designers and Art workers for manufactures in the principles of Form and Colour, and in the practice of compositions of various kinds, little has yet been done to bring Art Education into close touch with manufactures, except in rare cases where the cordial sympathy and assistance of employers is extended to the Schools. Some manufacturers hold the view that their apprentices and other employés only need the general training of being taught to draw and model accurately, to understand the principles of Light and Shade and Colour, the elements of Design and the History of Ornamental Styles. The technique of the manufacture they will learn at the Manufactory better than they can elsewhere. In some Schools the subjects connected with manufactures are taught by specialists who are employed in the local manufactories. But sometimes trade jealousies prevent this desirable specialist teaching being given. At the same time it is, though slowly, beginning to be realised that the ideal School of Art in a manufacturing centre should have its theoretical side dealing with instruction in drawing, modelling, painting and design from the point of view of true artistic principles, and a practical side dealing with the application of this theoretical knowledge to the processes of manufacture. In continental industrial centres Schools thus constituted exist, and are of invaluable service to the manufactures of their districts.

New Schools and Premises.

Several new Schools and Classes have been opened, and in some cases new premises have been provided. New buildings are not always carried out in a way which is suitable for Art instruction. A notable exception is the admirably planned new School of Art at West Bromwich, which has been presented to the town by Mr. Kenrick. It is well lighted for both day and evening work, and in this respect shows ingenuity in dealing with difficulties arising from the obstruction of light caused by an adjoining building, on the side contiguous to which the windows are filled with luxfer prismatic lights which afford twice as much

light as ordinary plate glass. In addition to ordinary incandescent electric lights, other special forms of artificial lighting have been provided in different parts of the School. In addition to the usual School of Art classrooms there are special rooms for embroidery, wood-carving, wrought iron work, metal work and enamelling; also a conservatory for the cultivation and storage of plants. A conspicuous and admirable feature of this School is the large well-lighted Central Hall, around which the various classrooms are placed. This Hall is used mainly as a means of exhibiting examples and works of Art necessary for reference by the students. The equipment is excellent, and includes, among many other items, iron racks, anvils, vices, benches, machine saws, folding sketch boards, blackboards, lockers, etc., etc., all of the most approved type. Contrivances of a simple and effective character for uninterrupted individual lighting are provided in some of the rooms. These and other details of the machinery of study existing here make the School able to deal efficiently with the theoretical, and the applied or practical sides of Art Education, especially in their relation to the local industries. West Bromwich is to be congratulated upon the gift of a fine and suitable building, which should be of great utility in benefiting the manufactures of the district.

Mr. Allport says :—

"The Schools of Art previously reported as in course of erection have not yet been opened, but satisfactory progress is being made towards completion and some of them will probably be ready for the work of the new Session 1903-4.

"A new Technical School has been recently opened at Wigan, in which Art rooms are provided ; this will enable the work which has been very creditably carried on in the ill-adapted Grammar School buildings, to be done under much more satisfactory conditions.

"Improvements have been made during the year in the classrooms at Sheffield, Sunderland, Newcastle and Preston Schools of Art, which are calculated to make them much more efficient for Advanced Art Work, especially in Life Studies and Painting.

"In some cases of Schools, which badly require additional rooms and more equipment, action has been delayed pending the passing of the Education Bill. Burnley and Bolton may be cited as instances of this among the larger towns, and the remarks equally apply to some classes for Pupil Teachers, which have for some time been carried on under most adverse conditions."

Mr. Lattimer says :—

"A new Evening Art Class has been established at Bracknell. Day and Evening Art Classes which have been defunct for some years have been revived at Dawlish and Exmouth. A new Art room has been built at the rear of the Grammar School at Wallingford. Plans for a Technical School at Brierley Hill, in which better accommodation will be provided for the Art classes in that town, as well as for an Art room at the Warwick High School for Girls, have been under consideration, with a view to building at an early date. In other places the erection of new buildings or the extension of premises at present in use has been considered, and it is very probable that active steps will be taken to effect these improvements now that the status of Governing Bodies is definitely settled."

Equipment.

It is gratifying to find that in many of the Schools there is a general movement in the direction of strengthening the equipment necessary for efficient instruction. There are, however, cases in which inadequate equipment arises from want of funds, some in which extreme parsimony rules, and others where the studies suffer because those in authority do not see the necessity for adequate equipment for Art instruction. There are some fortunately situated Schools—such, for instance, as the School of Art at Worcester, which has access to a really magnificent and well-arranged collection of beautiful shells, mineral specimens, birds, etc., in the local Museum. But the less happily placed Schools can in these days procure small collections of natural specimens useful for Art study at a very small outlay. Reproductions of works of Art, too, can now be obtained at small expense, and they are to be seen in the Schools more frequently than was formerly the case. Old-fashioned, cumbrous and unsuitable School furniture survives in some Schools, and it will, of course, take time for its supersession by more modern appliances. But it is certain that undesirable items in the equipment of Schools will disappear before long, especially in districts where the local authorities are alive to the importance of modern furniture and fittings.

Mr. Allport states:—

"Although in many of the Schools and Classes large desks and out of date appliances still exist, there seems to be a general desire for improvement and an appreciation of the greater convenience and efficiency of the more modern forms of furniture. Gradually old forms are being modified or give place entirely to new, and suggestions are usually readily received and carried out where financial circumstances will admit. The same remarks apply to lighting, which has been modified and improved in many of the Art Classes as well as in the Schools of Art during the past year.

"The special equipment necessary for study and research in some Schools is admirable, and the Art Masters are constantly on the look-out for books and objects of Art which will add to the efficiency of their Schools.

"Good examples of lettering and illumination have been acquired recently in some Schools, and in others old fire-places, portions of old wall staircases, iron gates and other objects of architectural interest and utility, —affording opportunity for measurement of things in the School which usually have to be sought elsewhere.

"The provision of butterflies and other suitable objects for colour study is becoming more common, and teachers are realising the necessity for better equipment in this direction."

Mr. Lattimer says:—

"While the better equipment of Schools and Classes make progress, it is nevertheless a matter which has largely been ruled by the funds at the Managers' disposal, and is sometimes delayed because of the diversion of funds to the purposes of classes in other branches of education. One sometimes feels too, that in proposing a moderate addition to the equipment, one is far exceeding the Managers' estimate of the needs of a Class in Art.

"In some cases where collective teaching is appropriate, the Teacher's energies are dissipated through the lack of appliances which would permit him to teach a group of students collectively. For primary instruction in Art the examples are sometimes not sufficiently varied in kind, and they might be more frequently multiplied for collective use. The furniture and

utensils to be found in the building—a collection naturally limited in variety—are frequently the only common objects at hand (although sometimes the Managers have arranged with a second-hand dealer to supply objects regularly as the teachers require them). Perspective is frequently taught without adequate apparatus, the student having to rely for a solution of his difficulties on geometrical diagrams to be found in the text books. The supply of plants is a difficulty amounting in some districts almost to an impossibility. In cases where a Local Authority has laid out a Public Park, it should be possible to supply the Schools regularly with an adequate number of specimens. Granted such a regular supply, the study of plant structure would be rendered more thorough than a study of drawings or photographs can make it, and the accumulation of materials for use in Design would be facilitated.

"For Design, the supply of examples is frequently (especially for small classes) less copious than it should be, and a student, instead of spending his time beside the best standards of the past, in a measure sets up his standard in the designs he sees at home, in the streets, and in the advertisement columns. A literary training which lacked full opportunities of studying the great masters of literature would be a poor stunted thing. Fortunately the supply of good publications increases from year to year to the advantage of teachers and students.

"As many illustrated books are costly, and perhaps beyond the present reach of Managers whose funds are small, such books might with advantage be cut up and the plates distributed among the classes in a given district. As a temporary expedient this would be useful.

"The use of small paper-covered books of drawing paper for Elementary work is fortunately decreasing. The main objections to such books, even when sufficiently large, are that they necessitate the use of desks, the tops of which are often not adjustable, and that they cannot easily be stored; the students consequently roll them up and take them home and so render the surface of the paper unfit for subsequent careful work.

"While the defects already mentioned exist in some Schools, in others the equipment is good. In some places special accommodation and equipment are provided for work in various materials."

Mr. E. H. H. Bruce says:—

"In some of the smaller country Schools, and even in a certain number of the Metropolitan ones, the standard aimed at is not sufficiently high owing to the absence of good examples of various works to display in the School for the students' guidance.

"The mere exhibition of the best of the drawings done in a class is not adequate, as these drawings do not reach a sufficiently high standard to be relied on as a guide. The works done at a School may, *inter se*, appear meritorious, but when brought into competition with a required standard fail to hold their own, and disappointment and discouragement ensue.

"The Managers of some Schools would confer a great benefit on the pupils at their Schools if they would make arrangements as far as possible to enable the Masters of Art Classes to procure such works and specimens as would be useful in furthering the progress of the students, and by acting on suggestions for improvement made by the Masters with regard to the conditions under which the work has to be carried on.

"An apathetic body of Managers is apt to discourage a master from making requests, and matters are allowed to slide, with the result that disadvantageous conditions are accepted as inevitable, and the work suffers in consequence."

Co-ordination

In many localities the important question of co-ordination has not yet sufficiently impressed itself on those having authority in educational matters. Some progress has, however, been made, and it is only reasonable to anticipate that the more this question is examined, the more will the desirability of co-ordinating in-

struction in Drawing and Art from the most elementary lessons in the Primary School to the highest in the School of Art become apparent. There are many difficulties in the way, the chief, perhaps, of which is the existence in one locality of Schools and Institutions governed by separate authorities, and it is probable that the working of the Education Act of 1902 may remove this serious obstacle; which in some instances involves the consideration of so-called vested interests. The benefits of co-ordination are so clear that it only needs a visit to the districts where it exists, to demonstrate the advantages obtained by its working. An interesting point in regard to this aspect of education is a comparison of the cost *per capita* of the individuals instructed under a system of co-ordination, with that in districts where overlapping displays itself.

Mr. Allport says:—

"It is satisfactory to note that efforts are being made in different parts of the Northern District to co-ordinate the Art work, by providing a correlated course of instruction which shall bring the work in Primary Schools of all kinds more in harmony with the higher work of the Schools of Art and larger Art Classes.

"In Scarborough the general Art work of the School Board has been placed under the supervision and direction of the Master of the School of Art, and the example of such places as Birmingham and Leicester appears to be commending itself to a large number of places in the district. One feels that it only requires an earnest endeavour on the part of the new authorities, the teachers, and others interested in education to bring about this desirable result.

"The co-ordination of the Art Classes with the Schools of Art is a question which vitally affects the large towns and cities in the district. At present Liverpool and Sheffield are almost the only places in which an attempt has been made to systematise the work by establishing a number of branch classes in various parts under the same authority as the large Central School. The Wallasey Technical Instruction Committee have co-ordinated their Art work on these lines; in Manchester some branch classes are working under the wing of the School of Art, but there is opposition in the shape of a large School Board Class within a few minutes' walk of the Art School; in Bradford almost all the Classes are under the School Board, and are in no way affiliated to either of the Art Schools; in Newcastle-on-Tyne the same state of things obtains."

Mr. FitzRoy reports:—

"The question of co-ordinating all instruction in Drawing and Art from the Elementary School to the most advanced instruction given in the Technical School is one of pressing importance. Much advantage may be expected to follow the establishment of special courses of Drawing instruction for Elementary School Teachers at Schools of Art or Art Classes. In many places where a beginning has been made the attendance is very satisfactory. At the Cambridge School of Art such a course has lately been started, and over 90 teachers from the neighbourhood have joined it.

"For some years the Drawing in the Board Schools of Leicester has been thoroughly organised and supervised by the Municipal School of Art, the result being most satisfactory. If such a state of things could be organized in all the manufacturing towns of this country, every factory boy would receive a sound training in Drawing which would fit him for a commercial life. Lately at a conference with the Managers of a School of Art in my District a member of the Committee (a retired coach builder) remarked

that if he had been taught Drawing in the way we described, many hundreds of pounds which he had missed would now be in his pocket. I quote this, as direct evidence in support of what I have pointed out above."

Mr. Lattimer says:—

"Co-ordination of a limited kind is in operation in a few of the places visited by me. Beside the branch Schools of Art which are controlled by the Master of a School of Art, there is a limited number of instances in which the Master of the local School of Art or Art Class teaches the upper forms of a Secondary Day School, or the Master of an Elementary School teaches an Art Class in his School in the evening. In one County Borough the Art Master employed by the School Board has drawn up a scheme of Drawing for Elementary Schools in the Borough, but in this case as elsewhere, the Managers of the School of Art and of the School Board have been working separately."

Mr. E. H. H. Bruce says:—

"There are two points which appear to limit the beneficial results which the study of Art, both in its relation to a liberal education, and its application to industry and commerce should bring.

"First, the want of a general systematic co-ordination between the smaller Schools and Classes and the more important Art Schools and centres, together with a scheme in which higher Art instruction is given with more forethought as to its fitness for the purposes to which the individual student wishes to apply it; and secondly, to a want of thoroughness in the work done by a great number of students during the term; the works in many instances not being carried far enough, being put aside either at the whim of the student or immediately any difficulty arises which demands a little extra consideration or labour. By this practice the essential difficulty for which the Drawing is given as a study is never surmounted, and this habit of shirking the difficulties is, in a subject as subtle as Art, perhaps more fatal than in anything else. The effect of this would be minimised by a sound system of co-ordination."

Examinations.

Attention has latterly been directed to the influence of examinations upon Art education, and widely diverse opinions are expressed in relation thereto. Some Governors of Secondary Schools hold strongly that the influence of examinations is good, and that they are absolutely necessary as a stimulus for the pupils. So convinced are they of this, that, since the Board of Education's examinations in the more elementary forms of Art subjects were discontinued, they have resorted to examination by other bodies, and the fact that they willingly pay the examination fees bears evidence to the courage of their opinions. Some teachers also hold the same view, and point out that since the discontinuance of the above named examinations, the number of elementary students in Schools of Art and Art Classes has decreased. Other teachers, whilst according no importance to the examination as a stimulus, look upon it as a harmless and undisturbing element in School life, which is necessary because of the satisfaction felt by parents in the Certificates gained by their children. On the other hand some teachers and Managers are strongly opposed to examinations, as interrupting, if not actually preventing, a sound educational course of study. In Evening Schools, however, it must be admitted that the attendance of artisans has decreased in the elementary classes since examinations in the more elementary forms of Art subjects have been relinquished. Whether

there is something in the national character that demands the stimulus of examinations, or not, will appear during the next few years, when their value will have been thoroughly tested by experience.

Mr. Allport says:—

"The examinations in certain subjects of elementary Art appear to have a very considerable influence on the number of students taking up the different subjects, and also on the degree of difficulty that is attempted in a subject in a given time. The above is shown in a marked degree in elementary Modelling. I have constantly heard regret expressed at the abolition of this examination, because of its adverse effect on the classes; in some Schools the elementary Modelling Class has practically disappeared, one or two students now taking it as compared with from 10 to 20 under former conditions. Drawing on the blackboard is, on the other hand, an illustration of the incentive of an examination; the number of students taking this subject would undoubtedly fall off greatly if the examination were abolished.

"Among students who require the Elementary Certificate there is a tendency by means of cram to try and get through an examination in one year which formerly took two or more, that is, the student does not go through a comprehensive course of study the first year in the elementary Stages and take up the more difficult work the second year, but tries at once to get the desired certificate in the shortest possible time. This rather points to the conclusion that if examinations at the different intermediate stages of study are to be abolished, students wishing to qualify for a Certificate should be compelled to go through an approved course extending over the usual time and not be allowed to cram a two or three years' course into one year. These remarks naturally apply more to Elementary Teachers and Pupil Teachers than to ordinary Art students."

Mr. FitzRoy says:—

"In one instance which may be mentioned the influence of examinations is bad. I mean the examination in Model Drawing. Some Teachers in Art Classes will tell you they must give the students the Geometrical Models to draw from because they will have them in the examinations; and that the time devoted to the study is so short they dare not give them anything but the models they will be likely to have at the examination. Instead, therefore, of receiving a thorough training to represent common things easily they are crammed to draw certain Geometrical models. Such teachers, while not affording their students the best course of instruction, are also jeopardising their chances of success at the examinations by curtailing the amount of time necessary for so important a branch of study."

Mr. Lattimer says:—

"Many teachers regret the cessation of examinations in the Elementary Stages of Art subjects. Their view is that students wish to feel how they stand with regard to others, and to measure their progress, and that examinations are a ready means of doing this. In some districts local examinations have been instituted to take the place of the old Board of Education examinations, and elementary students are presented for the local in lieu of the national examinations. But teachers feel that a local certificate has not the same value in the eyes of the candidates as a Certificate which records a candidate's ability as measured by a national standard. That the prospect of a success at an examination attracts students is to be seen, it is sometimes pointed out, in the decrease in the number of elementary students who practise Modelling since the suspension of the examination in the Elementary Stage of that subject. The abuse of

examinations by candidates who make the gain of a Certificate the principal aim might be met by making awards to students not on the results of examinations only, but on condition also that good and regular work had been done during the Session, that good progress had been made, etc."

Mr. E. H. H. Bruce says:—

"In considering the influence of examinations, or their absence, on Art instruction, it appears that where an examination for the purpose of qualifying for a Certificate is the sole aim of a student, the broader and more comprehensive understanding of Art and its applications is lost sight of, the result being a limited and narrow understanding of the subject; but where an examination is made simply a test of the quality of the work, it is found to be an incentive and an encouragement to further effort.

"At the Pupil Teachers' Centres, the Certificate being the chief aim of the students, their energies are necessarily focussed on a small horizon, and while they have a very limited number of hours of instruction, these hours in many cases broken up for study of various subjects, one cannot expect that a lasting or thorough knowledge can be gained.

"Perhaps there is no occasion on which one feels more the significance of the expression "*Ars longa vita brevis*" than at the Pupil Teachers' Centres, and in this connection I should like to add a word in praise of the great efforts that are made by the teachers at these institutions on behalf of their students, under conditions as to limited time which are the reverse of favourable.

"Illustrative of the importance which is attached to the gaining of Certificates, to the exclusion of all other considerations, in commenting on the unsatisfactory results of examinations at a certain centre, I was asked to consider the serious importance to the teachers of their failing to pass the examinations; on pointing out a perhaps more serious importance to the pupils who would have to be taught by them if allowed to pass the examinations when not properly qualified, it was explained to me that what happened after the Certificate had been gained was not what they had to consider, the important point being the number of successful examination results the Centre could show.

"It seems to have been very generally found that with the former discontinuance of the Blackboard Drawing examination, a disinclination to demonstrate on the board to their classes showed itself on the part of teachers, and that a deleterious effect on the teaching resulted."

National Competition.

The National Competition is a powerful influence upon Art instruction. It keeps up a condition of emulation and wholesome rivalry between the Competing Schools and Classes, and causes the advanced students to put forth their utmost endeavours to distinguish themselves in the contest for medals and prizes. On the other hand it gives rise to a dangerous tendency towards working in a set groove in various branches of work, but more especially in Decorative Design. As examples it may be mentioned that when a certain type of composition has received the approval of the Examiners by a high award, one finds in some Schools that the same type of Design is followed in a slavishly imitative way which is not at all educational; and, when a successful painting, model or drawing is executed in a particular medium of expression, there is a resort to that medium as being one in favour with Examiners. Occasionally, in imitative work a particular example has been taken up in the belief that the Examiners liked it. I have even been told in a School, when commenting on the unsuitability of a bird introduced without meaning or effect in a design: "Oh! If we put in a peacock we are sure to get an award, as 'So-and-so' is the

Examiner." It should, however, be said that these absurdly wrong views are only met with occasionally. Generally, the truth is realized that it is quality of work, and not peculiarity of treatment, example, or detail which is rewarded by the National Competition Examiners.

At times the view is taken in certain quarters that awards for applied Decorative Design are sometimes made without due appreciation by the Examiners of the practicability or otherwise of the designs from the manufacturer's point of view, and that in the past few years such designs for works in pure handicraft have received an undue amount of encouragement, whilst those schemed for reproduction by manufacturing processes are not sufficiently recognized. It does not seem to be understood that a well-planned practical design, presented in the form of a working drawing, from which the manufacturer could in the ordinary course of business produce the manufactured article, is considered on its merits as a design, even though, as a drawing, it does not in itself appear as effective as it would if presented in the form of a manufactured article.

The illustrated Report of the Examiners is much appreciated by the teachers and students generally.

Mr. Allport says:—

"The National Competition exerts a most beneficial influence on the majority of Schools; even an occasional book-prize going to a small School encourages the younger students of promise to try for the like distinction, and the acceptance of works (marked 'N. C.') for the competition is counted among the honours of the smaller Schools, and is felt to be some guarantee that the work is being carried out on sound lines.

"The advantage to Art Masters and students, especially those who are located in remote districts, of being able to see all the best work of the year collected in a National Competition can hardly be over-estimated."

Mr. FitzRoy says:—

"The influence of the National Competition is generally good. I think more importance at the National Competition should be given to Drawing and Painting from the Life; this study being so valuable as a ground work for all advanced Design, as applicable to manufacturing industries and to handicrafts.

"I also consider that it would be an advantage if the National Competition Exhibition were open to the public earlier in the year. There is no doubt if the existence of this Exhibition was more widely known it might have great influence on general taste. The unfortunate custom that it is only open in August debars many from going to it or even knowing anything about it."

Mr Lattimer says:—

"The utility and beneficial influence of the National Competition is universally admitted. It is felt that the Exhibition forms a standard with which the best work of each School may be compared, marks the annual progress of the Schools, and is evidence of their position in relation to education and industry. In fact, Schools which are far from the great Centres to which the National Competition Exhibition is sent feel their isolation, and teachers and students express regret that their opportunities of seeing good work are so few."

Mr. Bruce says :—

"The high standard required by the National Competition is productive of work of a high level of excellence, and is conducive to good results at the Schools as long as the idea in a work that has received an award is not too slavishly followed, but is studied with due regard and judgment as to the points of excellence in it."

Work.

Passing to the work done in the various subjects, the following remarks deal mainly with defects which have made themselves apparent. There are many excellencies in the work of Schools of all kinds, but these, with this simple comment, can be left to take care of themselves. Much of the elementary imitative work would be strengthened and the students would learn to draw with more freedom and boldness if "Free arm" Blackboard practice were more widely adopted. Some teachers show timidity in introducing such practice, fearing that it may lead to a lack of accuracy. But where concurrent practice in accurate pencil, brush, or pen drawing is followed, the danger of unbridled freedom is non-existent. In Geometrical Drawing the work is often slovenly and inaccurate, the points of contact of curved with straight lines are indeterminate, angles are wrongly plotted, and repeating patterns especially are vaguely constructed. Sometimes it would appear that the student is left too much alone with the text book, without the necessary demonstration or explanation of method. Blackboard Drawing is sometimes weak in the memory section, which is, in the few cases referred to, a mere matter of cram from printed examples of flowers, animals, common objects, etc., one view only of the subject selected—that given in the text book usually—being possible to the student. Fewer students appear to be studying Perspective Drawing, and the weak point seems to be the inability to understand the uses of geometrical plans and elevations, which are so necessary in this subject. Shadows and reflections should be more generally studied. In Freehand Drawing too much preoccupation about the kind of line supposed to be necessary to pass the examination appears. Distinct and accurate representation of form should be the aim here. Model and object drawing in the weaker Schools shows much ignorance of foreshortening, a kind of half teaching about the "vanishing" of lines appearing to satisfy the instructor in such Schools. In the study of Light and Shade there is a serious falling off. Loose, sketchy, feeble work is seen in many Schools. Though the teachers have complained of the complexity and unsuitability of the examples lately given in the Board of Education's examination in this subject, that is rather a reason for their seeing that the students study carefully from examples of simple form to secure their understanding the meaning and expression of "Shadow," "Shade," "Half Shade," "Reflection," "Light," "Half Light," "High Light," etc., etc. But in a large number of Schools, students are found working from the casts used in the examinations, to which the teachers have expressed objection. The study of Architecture often shows too much reliance upon the text book. Schools which have not an Architectural Museum or a good collection

of architectural casts, are often near admirable buildings to which the students should more often resort for study. The profiles of mouldings are not seldom practically ignored whilst an elaborate drawing of the enrichments of the mouldings is made. Studies of the human figure from the Antique and the living model are curiously unequal. In many cases memory drawing from the living model is attempted before complete imitative study has been effected. It is obviously of little use to memorise an imperfect realisation. In the work from the antique this defect is not so apparent, and it may be due in the life work partly to insufficient opportunity of studying from the living model. In some Schools such study is curtailed on account of the expense incurred in employing models. The study of anatomy calls for no special remark as to defects. In Design the predominant weakness is a lack of thorough nature study. Too often a hasty drawing is made from a spray of natural foliage without careful research into the principles of growth, the beauties of contour, and the more minute delicacies of form, and then a pretentious composition is imperfectly schemed by reference to this imperfect drawing. In some cases no study from nature is made, the details being annexed from one of the illustrated text books on design. Though improvement is shown, Lettering is still far from thoroughly studied in some Schools. In figure compositions too little recourse to nature often betrays itself, and in the illustration of classical or legendary episodes an imperfect acquaintance with the myth or legend is apparent. Ornamental painting is too often mere cram for the examination in this subject. Still Life painting would in some Schools be better done if simpler groups were arranged, and objects with little detail or pattern were used. The study of Principles of Ornament and Historic Ornament is frequently confined to text book work without reference to local buildings and museums. Modelling in all its branches often shows pupils working at subjects beyond their strength. This appears especially in figure studies in the round and in the higher branches of Modelled Design. The study of mouldings here appears often to be neglected or superficially followed. Students of Modelled Design who attempt subjects connected with architecture should have some knowledge of that subject, or at least of that part of it which is concerned with the details with which they are dealing in their designs: even if those details are only the mouldings of a panel or frieze. But the weakest point of all appears in the study of Colour, which in many Schools does not receive the degree of attention it requires.

Some Schools neglect the preservation of the executed work of the students, which should be kept together each session for the Inspector's examination in order that the progress of individual students may be gauged.

In the course of this report I have dwelt rather on faults than on merits, but it should be stated that the best work of the best Schools was never better than it is to-day. And where effort is being made I think it is exerted with more energy and more

intelligence than in the past. Therefore the outlook is hopeful as the example of the efficient Schools is bound in time to influence the weaker ones.

It is interesting to find here and there natives of other countries studying in our Schools of Art, as I have seen them in London, Manchester, Liverpool and other centres. In this connection Mr. FitzRoy says:—

"At Leicester Municipal School of Art I found a young French student, son of a Paris jeweller, sent from Paris to Leicester to take a two years' course to 'learn to draw and to design in the English way.' This appears to be some evidence of the appreciation of the work of English Schools of Art in France.

"At New Cross School of Art (Goldsmith's Institute) I also found four students from Toronto, Canada, come over for a year's course."

The fact that the teacher is the dominant influence in the work of Art education renders it fitting to refer again to the difficulties experienced by teachers in their arduous work. The position and qualifications of Art teachers are often misunderstood. The training of the efficient Art teacher gives him a sound knowledge of the History, principles and practice of various forms of Art and the manipulation of their different materials of expression. But he has a more important qualification than these. He has a knowledge—one most difficult of attainment—of how instruction in the principles and practice of Art is best conveyed to the students, who, as human material, vary infinitely more in character and behaviour, and are much more difficult of manipulation than the materials of practice in Art. The peculiar and special value of this expert educational knowledge in Art is apparent when the failures are recalled that have been made in Art education by men of eminence as Art producers. Until the special value of the educational qualifications of the Art teacher is more generally realized, his duties will be performed in many instances under conditions of discouragement and want of appreciation which are not conducive to successful work. Sometimes a teacher has to struggle against difficulties in the way of bad premises and equipment, without the nature of his disadvantages being in the least degree taken into account, or even realized by his Governors. An instance recently occurred in which some members of a Governing Body were not satisfied with the work of their Art Master, which they compared with that of a neighbouring School. It had not occurred to them until it was pointed out that their premises did not admit of some of the work successfully done at the neighbouring School being touched at all in their own, to say nothing of the cramped and unsuitable accommodation for most of the higher work, which is well provided for in the neighbouring institution.

When a School of Art forms part of a large institution such as a Polytechnic or a Technical Institute there are some instances of difficulties arising from the want of appreciation by those in authority of the means of keeping the machinery of Art instruction up to date. Occasional friction arises in large institutions from the drafting of Art students into other subjects of study,

and the placing aside of the Art Master's authority over the Art students. Happily such cases are rare.

Foreign Visits.

In my last Report I referred to the desirability of Art teachers having opportunities of visits to foreign countries to see the life and work of other nations. I am glad to be able to report that some of the Art Masters have during 1902 taken advantage of foreign travel. Among these I may mention the Head Master of an important School of Art in Surrey, who recently paid a voluntary visit to Spain, from which he derived much information on Art matters that will be useful in his work, and through his instruction, to the Art education of the country at large.

The Head Master of a School of Art in Staffordshire was sent in the summer to Germany and Austria by the County Council, for the purpose of visiting the principal glass making districts. As he is a practical artist in glass this visit could not fail to be of utility not only to him as a teacher but to the glass industries of the country, which will find profitable information in his excellent report to the Technical Instruction Committee of the Staffordshire County Council. The practical suggestions made by him as the result of his impressions should commend themselves to other localities, which would do well to follow the example of Staffordshire County Council and send the Masters of their Schools of Art to see what methods of teaching and manufacture are adopted in similar localities abroad. The expenditure involved will be a sound investment, through the strengthening thereby of our national industries.

In concluding this Report, which for obvious reasons deals chiefly with defects, and leaves untouched many points of merit in the work of instruction in Art and Drawing that exist in Schools of Art, Art Classes, Evening Schools, Secondary Schools, and Training Colleges, I should state that the defects referred to are such as should easily be remedied by a reasonable degree of attention and endeavour. There is little cause for anxiety at present in regard to the higher branches of instruction, as they are, on the whole, being well worked and steadily developed. But the serious falling off in the elementary work of Evening Schools is a matter upon which the attention and energies of the localities concerned should be directed without loss of time, in view of the probable adverse effect upon the higher work of the future; more especially in regard to the studies of artisans, upon whom the excellence or otherwise of our National Industries so much depends. That the requisite attention and energy will ultimately be brought into play there is little doubt, and if it is exerted in good time, the future of Art instruction in England and Wales will be secure in that progressive and upward path which is so desirable in these days of competition and keen commercial rivalry between the forward nations of the world.

I have the honour to be, etc.,

S. J. CARTLIDGE.

To the President of the
Board of Education.

REPORT ON THE TEACHING OF LITERARY SUBJECTS IN SOME SECONDARY SCHOOLS FOR BOYS.

By J. W. Headlam, Esq., M.A.

1. The following notes are based on the experience gained in the inspection of over 70 Schools. With a few exceptions these are second or third grade Schools—*i.e.*, the normal age for leaving is between 15 and 17. In some of these a few boys may remain till the age of 18 and proceed to the University, but this is very uncommon. In most a large number of the boys have received their earlier training in the Public Elementary Schools. The proportion varies greatly. In some of the newer Schools, which have been established by School Boards, Town Councils, or other Local Authorities, all the boys have passed through the Elementary School, and the Secondary School is really the Upper Class of the Elementary Department. In others the proportion will vary from 10 to 90 per cent. The standard of work is set by the local examinations managed by the Universities, or, in a smaller number of Schools, by the College of Preceptors. In the highest Form of the better Schools boys are entered for the Senior Examinations, or for London Matriculation. The Schools visited are in different parts of England, both in rural districts, in country towns, and in large industrial centres. In some boarders are taken, but they are predominantly, and in many cases exclusively, Day Schools. They may be regarded as typical of the institutions in which all those boys are educated who cannot afford to go to the great Public Schools, but require some education beyond what can be obtained in the Public Elementary Schools. I have taken no account of Girls' Schools, as the problems they present require separate treatment.

2. Many of the Schools are in receipt of grants from the Board of Education as "Division A" Schools. The conditions on which these grants are given require that Mathematics, Science, Art, and Manual Instruction should take the predominant part in the curriculum. Any criticism of the literary work must take this into consideration. In a School where all the pupils come from the Public Elementary School at the age of 12 or over, where they begin the work often completely destitute of any literary training, where at least 15 hours a week are bespoken for other subjects, where half the boys leave at the end of the first year, and where not above one-tenth remain beyond the second, it is clear that no great achievement can be expected in languages or literature. On the other hand, it is of supreme importance that what time is available should be used with the greatest energy and discretion.

Some of the older Grammar Schools have already submitted themselves to the regulations by which grants can be earned from the Board; others are only prevented from doing so by the

inadequacy of their buildings and equipment. Some are contented with the grants which are given on the lower scale ("Division B"); in them an adequate amount of time can be given to literary subjects. It is, however, to be regretted that, in consequence of financial pressure, Schools are tempted to apply for grants as full Schools of Science ("Division A") attracted by the higher scale, even though the course prescribed does not appear to be that most suitable to the history and traditions of the School, the character of the district, or the wants of the boys. There is also reason to fear that the desire to promote efficiency in Science by encouraging boys from an early age to devote so large an amount of time to the study of it may defeat the end in view; in several cases complaints have reached me that the want of training in the power of expression and the use of language prevents the boys profiting as they might from the instruction in Science.

3. In the majority of Schools, both those that receive grants from the Board of Education and others, I find that the nature of the literary education, both as to the subjects chosen, the methods of teaching, and the proficiency attained, requires the most serious attention of those interested in education. The efforts of the permanent Inspectors of the Board have, during the last years, brought about a great improvement in the mathematical and scientific work. Among those Schools which receive grants from the Board of Education, one necessarily finds a carefully graded and coherent course in these subjects; there is lavish expenditure of provision of apparatus for teachers, and generally the masters have a very adequate knowledge of the subjects they teach. All these qualities are too often absent in the literary work, which until recently has not, even in those Schools which are managed in accordance with the regulations of the Board, been subject to regular supervision. The different branches are not connected with one another; there is little attempt to organise a course which properly differentiates the work of the Upper and Lower Forms; there is no provision of such apparatus as may be necessary, and too often the masters are required to teach subjects of which they have little knowledge.

4. In many of the Schools visited no attempt is now made to give a classical education. There was a time when the general usefulness of the Grammar Schools was hampered by the concentration of interest on the few boys who desired a thorough classical training. This time has gone by. One almost fears that the reaction has gone too far. It is becoming increasingly difficult for a professional man who cannot afford to send his son to an expensive Boarding School to procure in the Grammar School of his district an education which will prepare him for a professional career. Greek has practically disappeared from nearly all these Schools. In many of the Endowed Schools an extra fee is charged to those who learn it—this at the same time that large grants are made by the Board of Education

and the Local Authorities for those who devote their time to the study of the Natural Sciences! In many Schools Latin is also disappearing. It will, if the influences now at work continue, soon survive only as an extra subject learnt by those who require it to pass the examinations admitting to the medical and legal professions. The position it holds in a modern curriculum is shown by the fact that it is often taken as an alternative to shorthand and book-keeping, for a period not exceeding three hours a week. The action of the University of London, which has made Latin an optional subject in the Matriculation Examination, is already beginning to affect the Schools.

The disuse of Latin seems to me to be a cause for serious regret. Even for those who never advance beyond the initial stages, the study of Latin supplies a training in the formal analysis of language for which it is not easy to find a substitute—certainly not in modern languages and English Grammar as they are now taught. It must also be noted that the great improvement in the text-books from which Latin is now taught, and the later age at which it is usual to begin it, remove many of the objections against the use of it which might at one time have been urged.

5. Literary study is therefore now represented in this type of School by Modern Languages, English subjects (History, Geography, Literature, Grammar), and in some cases a small amount of Latin.

The chief place in language study is taken by French. German is occasionally taken as a substitute for Latin; more often, if taught at all, it is reserved for the upper part of the School, and only learnt by a few boys. I cannot but think that it might be taught more frequently, for to many boys both the language and the literature are more congenial than French.

The teaching of French is in a state of rapid change. Every year it is more common to find attempts to substitute oral and conversational methods for Grammar and Translation. There are two causes which impede the change. The first is the difficulty in getting competent masters. Under the old system it was possible for men who had little real knowledge of the language to obtain very satisfactory examination results (and that was the only test of success); for the new methods, a thorough knowledge of the spoken language and great ability as a teacher are essential. These qualifications cannot be obtained for the salaries offered. Again and again head masters have spoken to me of the great difficulty they find in obtaining competent masters. The institution of modern language courses at the Universities, and the help given in some places by the Local Authority to enable promising teachers to pursue their studies abroad, will in time have their effect. We may, perhaps, look forward to the time when it will be exceptional for French to be taught by anyone who has not at least an elementary knowledge of the language.

It is also inevitable that the examining bodies must take some time before they can adapt their examination to the new methods of teaching which are now being tentatively introduced. It is very common now to find that the boys begin on one method, and then have to break off their course in the middle in order to prepare for an examination which pre-supposes an entirely different method of teaching.

This is not the place to compare the old and the new. There are, however, some observations which must be made. Whatever the merits and demerits of the newer method may be, it cannot but be an improvement on the old method, as it has hitherto been practised in most Schools. In few Schools has it yet had a fair trial. When boys enter School at ten, and remain till 15 or 16, then it should be possible not only to teach a language conversationally, but also to give a knowledge of its fibre and construction, and enable boys to advance so as to read with enjoyment and facility works of some literary merit. In very few Schools does one find this now. The course of School life is so short, the pressure on the Time Table is so great, that they seldom acquire anything of what can be called a literary knowledge of the language. And here I must point out that, however undesirable it may be to use classical works as a means of gaining an acquaintance with the elementary parts of a language, any system of education is radically deficient which does not enable boys at some time to study with care and minuteness some of the great masterpieces of literature. There is much danger that this will be forgotten in the desire to give all language instruction an immediate commercial value.

The position of the study of language in the general course also requires determining. Under the older classical system the study of the language led on imperceptibly and necessarily to the study not only of literature, but of the whole life and institutions of great nations. The door was opened to History, Philosophy, Art; this is now quite ignored. Boys learn a little Latin and French. In nearly every case they are completely and absolutely ignorant of the most elementary facts (I use this language deliberately) regarding the history and life of the people whose language they are learning.

6. In the teaching of French there is at least hope and promise for the future. In English subjects this is not the case. In a very large number of Schools the teaching has not yet reached that stage at which criticism begins to be useful or possible. The very first elements of good work are absent. The instruction is based exclusively on text-books. The masters have no knowledge on the subject except what they gain from the book which the boys use. They therefore make no attempt to supplement, correct, and select from or explain the information given in these books, though the statements made are necessarily unintelligible unless further information is available. The books themselves are sometimes fairly good;

sometimes they contain nothing but the baldest statement of facts. Motives of economy (which are entirely disregarded in dealing with Natural Science) require that the same book should be used in several successive forms, and boys of 16 still continue to learn their history from the book they used when they were 13. No history but English History is taught, although an understanding of English History is impossible without some knowledge of the History of the Continent. The period chosen for study is determined not by the previous career of the boys, but by the syllabus of an examination; and I have, for instance, not once, but repeatedly, found boys studying the Wars of the Roses who are quite ignorant of all previous history—in one case so ignorant that they did not know who William the Conqueror was. This I have found in a really good School, but the master had never thought of making the enquiry what their previous knowledge was; the point was of no importance for the examination for which the boys were being entered. Geography, even in the Upper Forms, remains merely an acquaintance with the names on the map. No attempt is made to explain the general principles of Physical Geography on which the configuration of the countries depends, or the historical causes of their political condition. No attempt is made to connect the history and geography. It often happens that the master who takes the one does not trouble to enquire what they are learning in the other. In the same way English Grammar is taught entirely without reference to the other language work which the boys are doing; the rules of Grammar are conveyed to them in the form of laws learnt from a text-book, but there is no real training in the observation of idiom or the correct use of words.

7. In this connection it is necessary to draw attention to the question of School libraries. To teach history, language, or literature without books is as absurd as to teach science without apparatus. The latter course is now forbidden; the former is almost universal. In a large number of Schools there are no libraries at all. In a considerable number there is a collection of story-books for the amusement of the boys. In scarcely a single School has an attempt been made to form a collection of books which the masters and boys can use in the illustration of School work. There will be a finely-built and well-equipped laboratory, an unlimited supply of expensive material for the teaching of Chemistry and Physics, but there will not be found a good Atlas of modern times, much less an historical Atlas. There will be no standard dictionary of the English or any other language. The master who is giving a lesson on English History will find no book to which he can refer for information where the text-book is defective, or for those illustrations and details without which no narrative is more than words. There are in the English language books of the greatest interest and merit dealing with those scientific studies in which so much time is passed; there are books on Natural History and Travels which would be of interest to many boys. Their existence is in many

places entirely unknown to them. How can it be expected that they should acquire a love of reading or of study?

8. The result is that it is no uncommon thing for a bright and intelligent boy to leave School at the age of 16 or 17, without ever having had an opportunity of becoming acquainted with any book except the text-books, written purely for School purposes. At the best he will have read a poem of Scott and a play of Shakespeare for examinations, and even this is made destitute of educational value by the nature of the editions used, and the excessive importance attached to notes and philological discussions far too advanced for the boys. To take a single case, the edition of the plays of Shakespeare most commonly used prints all difficult words in italics, thereby distracting the attention from the sound and beauty of the verse and discouraging all spontaneous observation. Reading aloud—the only introduction to literary taste—is often quite neglected, and in many Schools the boys are quite ignorant of the most well-known English verse. I know one School where the only device a master could think of for getting up "Robinson Crusoe" for examination was to give his pupils a certain amount to write out every evening. The boys have an excellent introduction to the study of the Natural Sciences, but they are not introduced to the world of books and literature. They are not taught to read for pleasure; they are not taught how to use books so as to extract information from them. The training of the imagination and sympathies, which is the chief use of History, is absent. The boy has no acquaintance with the English language as used by those who know how to use it, and it is not surprising that when he attempts to express himself on paper or orally he has little skill or facility.

Were it not that from time to time one sees what excellent work can be done when there is a teacher with knowledge and interest who believes in the importance of what he is teaching, it would be difficult, after visiting many Schools, not to lose all faith in the possibility of making literary training useful and efficient.

It must be remembered that those who are educated in these Schools are those in whose hands will rest the greater part of the local government of this country. From them come the greater number of the teachers and the writers for the Press. They are allowed to leave School without any adequate training in some of the most important parts of mental activity. While fully recognizing that the Natural Sciences and Mathematics must in very many Schools have the predominant place, I submit that the neglect of and indifference to other sides of education must have a most harmful influence on the intellect and character of the nation.

5 (a). EXTRACTS FROM THE REPORTS OF THE EXAMINERS ON THE RESULTS OF THE SCIENCE EXAMINATIONS, 1902

Group I.—Pure and Applied Mathematics.

Board of Examiners.

V.	Mathematics	Rev. J. F Twisden, M.A., *Chairman.*
VI.	Theoretical Mechanics	A. R. Willis, M.A., D.Sc.
XX.	Navigation	P. T. Wrigley, M.A.
XXI.	Nautical Astronomy	Major P. A. MacMahon, F.R.S.
		H. B. Goodwin, M.A., late R.N.

MATHEMATICS.

EVENING EXAMINATION.

There are fewer candidates for examination this year than there were last year. Thus, in the First and Second Stages there were about 6,300 last year, and hardly 5,200 this year. This falling off is not restricted to the First Stage.

First Stage.

The work in this Stage is, perhaps, as good as the average of the last few years. A fair proportion of the work is distinctly good. In *Arithmetic* there were many good answers. In *Geometry*, the Definitions were often faulty, though probably they were better given than they used to be. The Propositions were often well written out, though in many cases slovenly and inaccurate work was sent up. The easier deductions were often successfully attempted, but the harder deductions were very seldom attempted to any purpose. In *Algebra*, the work was, on the whole, as good as usual.

Second Stage.

In *Geometry*, the Definitions were often ill given. The Propositions were often well written out. In *Trigonometry* it may be noticed, as probably indicating faulty teaching, that very few succeeded in stating clearly the rule for extracting the cube root of a number by Logarithms, and still fewer in proving it.

Third Stage.

The number of candidates is rather less than last year. The general results are equal to the average of the last three years, but they fall somewhat below those of last year. In *Trigonometry* the feature of the examination most needing the attention of Teachers was the weakness of the attempts to deal with functions of angles greater than a right angle.

Fourth Stage.

The average standard attained was a little higher than last year. The best work this year was that done in *Spherical Trigonometry.*

Honours—Part I.

There is a small falling off in numbers, as compared with recent years, *e.g.*, in 1900 there were 69 students examined, in 1901, 59, in this year, 53; but the falling off is perhaps compensated by the number of highly marked papers, *e.g.*, 12 students got 200 marks or more in 1900, 19 in 1901, and 20 in this year. The Questions in Geometry were often well answered. This was perhaps the best point in the Examination, which was on the whole very satisfactory.

Honours—Part II.

There were four candidates, one of whom did very well indeed. The three weaker papers contained good answers to two or three of the questions in each case, and partial answers to several others.

Division II.—Fifth Stage.

The number of candidates is about the same as it was last year. The work on the whole is satisfactory, but the general results are not quite so good as those of last year.

Sixth Stage.

There were 26 candidates as against 18 last year. The results are fairly good; thus four or five sent up good papers, and only six obtained less than one-third of full marks.

It was satisfactory to find that the questions on Differential Equations were well answered by more than half of the candidates.

Seventh Stage.

Three candidates took this stage; the questions on the Differential Calculus and on ordinary Differential Equations were fairly well answered.

Honours—Part I.

There was only one candidate; he gave good answers to three of the questions, but his attempts at other questions were not very successful.

Honours—Part II.

There were no candidates.

DAY EXAMINATION.

First Stage.

As compared with the day examination of last year, there is a slight falling off in the number of the candidates for examination. Also the results obtained are not so good as they were last year, though the results in some schools are much better than those in others. Thus, about the same per centage of the students in both years obtained moderate marks (from 30 to 60); the per centage of those who got high marks (viz., 60 and more) is distinctly less than it was last year, and, of course, the per centage of those who got low marks (under 30) is greater this year than it was last year. In *Arithmetic* the work is not more than fairly good.

The work in many cases was well written and accurate; but in these respects some schools were much better than others. It would be worth while to draw the attention of teachers, and perhaps of managers, to the point that neatness and accuracy in most cases go together, *e.g.*, when a calculation, which can easily be performed in half a page, is made to cover a couple of pages, the result is very apt to be wrong. It also shows that the student has been allowed to get into slovenly ways.

In this connection, it may be mentioned that teachers would do well to encourage their pupils to use a straight edge and a pair of compasses in drawing their diagrams. In some schools this is done, and oftener than used to be the case, but there is still great room for improvement.

Second Stage.

As compared with last year, fewer students have presented themselves for examination, and the results are not so good in much the same way as was remarked in the first stage, viz., the number of those who get moderately good marks (from 60 to 120) is, proportionately, about the same in both cases; but those who get high marks (120 and more) are fewer, and those who get low marks (under 60) are more, proportionately, than they were last year.

On the whole, the work is done in better form than was common a few years ago, but there is still room for improvement. There is no need to repeat what has been said in the notes on Stage 1—about the relation between neatness and accuracy—however, we may add:—(*a*) that it conduces to accuracy in logarithmic work when the logarithms are arranged one under another, and not one after another in the same line; (*b*) that the students should use in their trigonometrical work, in addition to a pair of compasses and a straight edge, a protractor and a scale of equal parts, partly as a help towards accuracy by showing the thing that is to be reasoned on, and partly as a means of verification; (*c*) that the students should be practised in verifying their results, *e.g.*, when a result works out to $x=10$, they should be taught to verify that 10 actually satisfies the conditions.

Third Stage.

Although full and correct answers were made several times to each of the questions, the great bulk of the answering was confined to the easier questions or the easier parts of questions.

So far as it went, the work was usually well done, but there were not many highly marked papers.

Fourth Stage.

Twenty-three papers were worked in this stage, with results very similar to those in the evening examination.

Fifth Stage.

There were sixty-four candidates. Both in Analytical Geometry and in the Calculus there had evidently been very careful and intelligent teaching.

Sixth Stage.

Six candidates took this stage; two sent in good papers, and the other four did fairly well.

Seventh Stage.

There was one candidate; he worked a fairly good paper.

THEORETICAL MECHANICS.

Solids.—Elementary Stage.

The general impression made by the answer-books of the candidates is satisfactory, though there is still abundant evidence of defective teaching. This remark applies particularly to questions involving force, work, and horse-power; teachers may, with advantage, spend more time over these matters, giving copious illustrations. Graphical methods have been carefully studied; more written explanation in regard to the diagrams might be given with advantage both to students and examiners.

Solids.—Advanced Stage.

A satisfactory examination. There was, however, a good deal of vague answering which made the marking a matter of considerable difficulty.

Fluids.—Elementary Stage.

Nearly one-half of the candidates have obtained more than 60 per cent. on the papers, so that the result may be considered to be quite satisfactory.

Fluids.—Advanced Stage.

A satisfactory examination, but not more so than usual.

Honours.—Parts I. and II.

There were few candidates, but these were quite equal to submitting work which showed that they had studied Advanced Mathematics up to the Honours Standard. Answers to particular questions showed that students who obtained a small total had yet a grasp of a portion of the subject, and might have done better had the papers suited them better. The papers suited the majority of the candidates very well.

DAY EXAMINATION.

Part I.—Solids.

Elementary Stage.

The number of candidates is nearly the same as it was last year. The work is quite exceptionally good. Nearly half the candidates obtain sixty marks or more.

Advanced Stage.

As compared with last year there is a slight falling off in the number of candidates in this stage, but the results are distinctly better, *e.g.*, the number of highly marked papers (120 marks and upwards) is distinctly larger, and of low marked papers (under 60 marks) distinctly less. On the whole the result is good.

Part II.—Fluids.

Elementary Stage.

As compared with last year, more students were examined, but the work was not quite so good. A portion of the work, about one paper in six, was distinctly good, but in the majority of cases (115 out of 185) the marks were between 29 and 60, a result which plainly shows that a great deal of the work was, perhaps creditable, but hardly good. One common fault was that a great deal was written that was little to the purpose.

Advanced Stage.

Only thirty-four students took the Advanced Stage Paper this year, whereas forty-six took it last year. These numbers are perhaps, too small for founding a comparison on; however, last year only five students, while this year seven students obtained more than 120 marks, *i.e.*, one student in nine last year, as distinguished from one in five this year.

NAVIGATION AND SPHERICAL AND NAUTICAL ASTRONOMY.

In the examination of the present year, a somewhat important change came into operation for the first time, Spherical Astronomy having been added to Nautical Astronomy as a subject.

Navigation.

Elementary Stage.

As was the case last year, only a small batch of papers, thirty-one in all, was sent in. Of a very good group of thirteen, all except two gained at least 60 per cent. of the total, and none had less than 40 per cent.

Several candidates took the distance in miles between two places in the same latitude to be the same as the difference of longitude in minutes, and many considered the distance between two such places, as measured in the parallel, to be necessarily the shortest distance.

There were several instances also in which candidates, in finding the course between two places, worked the arithmetical calculations accurately enough, but vitiated the result by carelessness in naming the result north instead of south, and east instead of west or *vice versâ*.

Advanced Stage.

Although the number examined showed an increase upon last year, the results in general were better, and the number of failures, five, was also smaller, since as many as eleven failed in the previous year.

An improved knowledge was shown of the useful practical methods of finding courses and distances by the aid of the Traverse Table, and candidates seemed to have a better grasp of the meaning and use of this table generally.

On the other hand, there was much inaccuracy in finding the values of the compass deviation by reciprocal bearings. Candidates rely too much on verbal rules, instead of making use of diagrams to show the relative position of the magnetic and compass North.

The "Day's Work" was generally worked with accuracy.

Spherical and Nautical Astronomy.

Elementary Stage.

This paper was divided into three sections, and candidates were at liberty to answer eight questions, four of which had to be selected from Section I the remaining four being taken either from Section II or from Section III. As Section II consisted wholly of questions of a practical nature in Nautical Astronomy, and Section III entirely of Spherical Astronomy, while Section I was made up equally of questions in Nautical and Spherical Astronomy, this option permitted a candidate to obtain his marks upon either one of the two branches (Nautical or Spherical Astronomy) as he preferred.

Only seven papers were sent in altogether, and three of the seven candidates availed themselves of the option to take Section III. All these passed a very good examination.

Of the remaining four, those namely who took Section I and II, only one reached 60 per cent. of the maximum, and two were below 40 per cent. The work of questions in Section II, the practical examples, was particularly weak.

Advanced Stage.

In the Advanced Stage the same arrangements held as to the structure of the paper as in the Elementary Stage, that is to say, there were three Sections, and candidates were required to take four questions from Section I, and the remaining four either from Section II or Section III as preferred. As it happened of 33 candidates, one only took Section III, and he answered the four questions permitted with a fair degree of success. Of the remaining 32 papers hardly any was good right through, except one, who gained 80 per cent. of the total marks. The practical questions, however, were very well done by almost all, the work of Latitude by observation near Meridian, Error of Chronometer, and Time Azimuth, in particular, presenting evidences of very careful instruction.

In the Advanced Stage of Nautical Astronomy the explanations of processes made use of are inferior in quality to the practical logarithmic work. This is perhaps often to be accounted for by the slight basis of mathematical knowledge possessed by the students, but some improvement would perhaps result if teachers would insist more strongly upon the construction of diagrams showing roughly the position of the Spherical triangles employed in the work.

Spherical Astronomy.

In the *first stage*, three students seem to have paid a good deal of attention to Spherical Astronomy; they showed this partly by their answers in Section I, and much more by their answers in Section III. In the *second stage*, one student answered three questions well and a fourth question imperfectly in Section III, and another student gave good answers in Section I. In Honours Part I. the answers were, on the whole, creditable, and, among other things, showed that attention had been paid to Stereographic Projection.

Navigation and Astronomy.

Honours—Part I.

The paper was divided into two sections, A and B, of which Section B dealt wholly with Spherical Astronomy. Candidates were at liberty to take their questions entirely from one or other section, or equally from both. Three out of six candidates took half of their questions from Section B (Spherical Astronomy). The best of these showed a good knowledge in both sections, obtaining 82 per cent. of the maximum marks.

Honours—Part II.

With the same arrangement as to alternative questions, only two candidates sent in papers, neither of whom attempted questions in Section B. The percentages of total marks gained were 56 and 43 respectively.

Group II.—Engineering.

Board of Examiners.

I. Practical Plane and Solid Geometry II. Machine Construction III. Building Construction IV. Naval Architecture VII. Applied Mechanics XXII. Steam V.*p.* Pract. Mathematics	John Perry, M.E., D.Sc., F.R.S., *Chairman.* J. Harrison, M.I.M.E., M.I.C.E. T. A. Hearson, late R.N., M.I.C.E. James Perry, M.E. J. Harvard Biles.

PRACTICAL PLANE AND SOLID GEOMETRY.

There was a considerable falling off in the number of worked papers this year as compared with 1901, principally in the Elementary Stage, amounting altogether to nearly 37 per cent. The actual numbers for 1902 were:—In the Elementary Stage 1571; Advanced Stage 819; Honours, Part I., 135; and in Honours, Part II., 4.

It is satisfactory to be able to report that the results of the Examination compare very favourably with those of last year, notwithstanding the fact that many and important changes in the syllabus have been made since then and that the examination was the first one held under these new conditions.

The object in altering the syllabus has been to ensure that students shall be more thoroughly grounded in both the Art and Science of the Subject, and shall be trained to apply their knowledge and acquirements readily and efficiently to the many problems which modern science has opened up specially adapted to graphical treatment.

Elementary Stage.

General Remarks. In this stage the instruction and class work should be mainly directed towards exercising the student in the proper use of his instruments, squares, scales, protractor, etc., and to making him very familiar with the fundamental principles of geometry, the teacher using all available means at his command to secure this end. There should be many and varied illustrations and experimental verifications of geometrical truths, made by the student himself, including quantitative measurements of accurately drawn figures, or models, or other suitable objects.

A common fault is to allow the use of soft or blunt pencils. Faulty squares are employed, which might easily be set right with advantage to all concerned. Students are inadequately provided with suitable scales as is evidenced by the frequency with which they construct more or less faulty scales on their examination paper to enable them to measure their results and give the answers, thus wasting time and often losing marks because the permissible error limits are exceeded. Decimal scales were much more freely used than last year, though they are not yet universal, answers being often measured very awkwardly in clumsy fractions. There seems to be a great want of a good and cheap protractor. Teachers must expect greater stringency in regard to these matters in future examinations.

Advanced Stage.

General Remarks. On the whole the paper was well done, and, with some exceptions, the neatness was a marked improvement on the elementary stage. Some students, however, used soft and blunt pencils, and were generally careless: due, no doubt, to lack of proper training in the earlier stage.

DAY EXAMINATION.

Elementary and Advanced Stages.

General Remarks. In the Elementary Stage the quality of the work done was on the whole even better than that in the same stage of the Evening examination. Teachers and candidates had evidently profited by a study of the latter. In the Advanced Stage, many of the Schools sent up excellent work, but the results, taken altogether, were not quite up to the standard reached in the Evening paper, mainly owing to the inclusion of a number of very inadequately prepared classes, the contrast between the good and bad work being very great.

In both stages there was a gratifying diminution in the proportionate amount of slovenly drawing. In some cases, indeed, in the Advanced Stage, candidates erred in the other extreme, and, ignoring the paragraph stating that their constructions must be "distinctly and neatly finished," used such faint lines, without any subsequent reinforcing, as to render their work almost invisible to the Examiner.

As before, measured results were often expressed in cumbrous vulgar fractions. We must repeat that the use of decimal scales should be universally enforced. Some candidates, again, were either without scales, or were curiously afraid of using them; and so they constructed scales from which to obtain their answers, resulting in a waste of time and a sacrifice of accuracy.

MACHINE CONSTRUCTION AND DRAWING

Elementary Stage.

General Remarks.—The number of candidates in the Elementary Stage was 4,374, being slightly less than the number last year.

The results of the Examination compare unfavourably with those of 1901. This is probably in a large measure due to the fact that many teachers restrict the class work to mere drawing to scale from dimensioned copies supplied, while it is the object of Examiners to encourage and reward a more important kind of work, in which the student makes sketches and takes measurements of parts of actual machines, and then makes the scale drawings from his own dimensioned sketches.

The falling off in the average quality of the work is also to some extent due to the candidates not being well prepared to execute the inked tracing, which was a new feature of the Examination this year.

We wish further to call attention to the fact that although squared paper is now supplied to all candidates, very few availed themselves sufficiently of the advantages thereby conferred in making the freehand sketches required in answer to some of the questions.

A workmanlike method of setting about a drawing is frequently lacking. A large number of candidates appeared to have had no practice in tracing, and were unable to set about it properly. General knowledge of the behaviour of the paper, ink and instruments appeared to be deficient.

There appears to be no systematic training in the sketching of machine details. The great majority of the sketches were crude, too small, in bad proportion, not in projection, and lacking in detail.

Advanced Stage.

In this stage there were 3,643 candidates, being a slight increase on the number of last year; but the total was unhappily swollen by not a few who, if they could be regarded as being prepared for examination at all, should have been relegated to the Elementary Stage. This is unfortunate in the interests of the candidates individually and education generally.

After dismissing those to whom the previous remarks apply, it may be said of the remainder that their work was such as to create a favourable impression in respect to the quality of the teaching.

Honours.—Part I.

In this stage there were 302 candidates, being 18 per cent. increase on the number of last year.

Honours.—Part II.

In this stage there were 26 candidates; a few less than last year, but they included very good men.

Ten were selected for the Practical Examination at South Kensington, of whom 9 presented themselves and quite justified the choice, all securing a class, three being thoroughly First Class men.

BUILDING CONSTRUCTION.

It appears to be necessary to say that this subject cannot be learned from books alone. More than in the case of any other of the subjects of the group, the *practice* of building differs from what is taught in the books. The student reads history in old buildings; buildings now being constructed are modified in various ways by the circumstances, the fashion of the time, the money available, the materials in the neighbourhood, etc. Building

Construction as seen in actual buildings in some degree compares with the development of animals or plants. We speak from experience; the young student requires to have it explained to him why the books differ so far from the house he lives in and from the other familiar buildings which he sees everyday.

Every kind of construction may be seen in buildings—the compilers of books appear to profess that they give the best construction. The chief defect in the books is a want of proportion—the old and worn-out methods are retained, given at large, and the new methods are imperfectly given. An important duty of the teacher is to correct this want of proportion in the books; he should himself have a practical knowledge of building—indeed, to be a successful teacher, he must have practical knowledge; one may as well hope to learn anatomy from a book as Building Construction from books alone.

Judging by the whole results of the examination in this stage the questions were fairly within the present range of the candidates except in regard to their power to apply calculation. More attention should be given to this part of the work. The attention of students should be directed to locks and other fastenings. There are some experiments with materials which are easily made anywhere, as, for example, the mixing of sand and lime or cement, and wetting the mixture and then measuring the resulting mortar; this may be done using old cocoa tins, or other like things, as measures. The students, and perhaps the teachers, may not be able to explain the phenomena which will sometimes present themselves in such simple experiments, but they may be able to get help from others. For example, it is explained that the cement and water hide themselves in the interstices between the grains of sand, but this only goes part of the way, because if dry sand is put into a measure and moderately pressed, adding water makes the sand contract in the measure. An intelligent teacher will notice such things as that lime putty shrinks and cracks like starch in drying and that mortar does not do so. If one observes the cracks in the plaster on an old ceiling, it will be seen that no two cracks quite cross each other at a point. The teacher should ask questions, and he should above all encourage his students to ask him questions.

Advanced Stage.

The Examiners offer no general remarks on the work in the Advanced Stage.

Honours.—Part I.

The answering in this stage is not equal to what should be expected from Honours candidates. The standard of marking was a rather low one, yet a very large proportion of the candidates failed to pass.

In preparing for Honours, Part II., Division I., it may be useful for students to remember that the elements of Classical Architecture (the architecture of Greece) are reducible to a few forms. The orders, mouldings, and ornaments, may be all shown on a few moderate sized sheets of drawings. The student cannot know these too well; he should be able to sketch these from memory; he should be familiar with their marks and tokens. It is not necessary, for this examination, to burden the memory with the names of many temples, or to go minutely into differences of examples of any one order. With, first, a definite knowledge of the best Greek forms the student should endeavour to trace their evolution from the more ancient forms and also to follow them forward into what they became in the hands of the Romans. He may have his own theories as to architectural degeneracy. He may be able to see in what happened to Greek architecture in the hands of the Romans a suggestion of what has happened to the art of architecture in modern hands. Let us assume that the Parthenon was the most perfect example of Greek architecture—a model of the Parthenon will not serve for a railway station. The modern variety of purposes of buildings introduces great complexity, and we appear to

make slow progress in evolving architectural forms suitable to the modern purposes. The best we can do appears to be to use the old forms as decorations. The decorations of the Parthenon were not its pillars, they were its sculptures. Fifty years ago mechanical engineers made use of classical columns in their machines; they do not do so now, and the change adds much to one's comfort in looking at modern steam engines. The development of pointed architecture is comparatively recent, and it may be easily followed: notwithstanding great apparent complexity, the elementary forms are few, and the subject is again a simple one—a temple or church.

In the elemental forms of classical architecture, and also in those of pointed architecture, the student has examples of the results of progressive development valuable in themselves, and valuable for the lessons they teach. Every animal and every plant is exactly fitted for its life, and it is beautiful to the person who can see the fitness; there are, however, some animals and some plants which we think more beautiful than others; as, for example, a horse compared with a crocodile, and a rose compared with a mould. It is a safe rule to design a building with strict regard to its purposes, but there is much room for art outside this. These remarks are not to be taken as oracular; in no subject is there greater room for difference of opinion; it is intended to encourage students to think for themselves—to have opinions of their own, but these original opinions must be associated with enthusiastic work and study.

Thirteen candidates were admitted to the examination in Practical Design at South Kensington. No really good design was sent in, and the drawing was generally careless, inaccurate, and untidy.

This part of the examination is particularly disappointing.

NAVAL ARCHITECTURE.

The value of the squared paper supplied to the candidates for drawing rough sketches approximately to scale, or the drawings required to be copied, does not seem to have been noticed; in some cases candidates actually took the trouble to rule up into squares the blank drawing paper supplied.

Students should be encouraged to make good rough free-hand sketches of the different parts of a ship's structure approximately to scale, and for this, paper ruled in faint squares would be very helpful.

APPLIED MECHANICS.

Candidates in all stages go wrong in easy arithmetic. They will not use contracted methods or slide rules, or the logarithm tables provided for them, and their teachers evidently pay no attention to the reports made by the examiners every year. Very little experimenting seems to be done by the candidates themselves, and yet the apparatus required for simple experiments is very cheap. It does not seem to be understood by teachers that working knowledge of the principles of Mechanics cannot be obtained from lessons or books; that experiment and numerical exercise work are absolutely necessary. Year after year there is the same evidence of want of common-sense in teachers and waste of good material in students. The fundamental notion of Mechanics does not seem to be taught at all in many schools.

STEAM.

Elementary Stage.

An increasing number of candidates use the tables or the slide rule, in working out the numerical questions, but on the whole there is considerable room for improvement in the methods of calculation. Too many candidates use the ordinary long processes for multiplication and division. In some batches of papers the candidates were apparently unable to work with decimals, and had to turn any decimals given into vulgar fractions. One such candidate left a result in the form $101\frac{25}{7}$

A considerable number of candidates make no use of the squared paper supplied. For example, in forming the hypothetical indicator diagram in Question 5, some candidates would laboriously set out scales of their own, ignoring the fact that the squared paper furnishes a decimal scale ready to hand.

The sketches were in general only fair; in most cases very little detail was shown.

Advanced Stage.

No general observations are offered by the examiners on the work in the Advanced Stage.

Honours.—Part I

The sketches are all fairly good. On the whole, the answers requiring laboratory knowledge were ingenious and satisfactory; but a large proportion of the candidates showed that they had never really made measurements in a laboratory. It is pleasant to find that candidates are able to make calculations on the θ ϕ diagram; it is no longer a thing to be merely talked about; it is a tool to be used in a practical way. The answers to some of the questions illustrate that weakness of many candidates which causes such great reductions of marks throughout the paper, weakness in Arithmetic. Usually a candidate seems to think that arithmetical accuracy is of no importance. The examiner has to be prepared for answers just twice, or half, or ten times, or one-tenth, of the correct answers; also for answers quite absurd. A candidate, who is evidently a fair mathematician, good in theory, will give answers which any practical man would know to be ridiculous

The Balancing of Engines is not well known. The easy "Governor" question was answered correctly by very few. Candidates describing the lubrication of Engines know the methods of the books, but they seem to observe nothing if they really ever enter a modern engine room. The Graphite method of lubricating a cylinder was known to some five or six candidates only.

Honours.—Part II.

The sketches are not satisfactory. The answers requiring laboratory knowledge were ingenious and satisfactory, but candidates have evidently too little laboratory experience as a rule. Candidates are usually able to really calculate upon a θ ϕ diagram. Hypothetical diagram questions are very well done. As a rule, the candidates attempted the same usual text book questions, and did not attempt the questions which were to any extent novel, being based on recent investigations, although these had higher marks.

PRACTICAL MATHEMATICS.

The number of candidates was 469 in the Elementary Stage and 137 in the Advanced Stage. Last year the corresponding numbers were 250 and 57. It will thus be seen that the total number has increased by nearly 100 per cent.

The standard reached was not quite up to that of 1901 in either stage. In the Elementary Stage this was partly due to the fact that some classes were sent in to the examination totally unprepared, and in which the character of the examination appeared to have been entirely misunderstood by those responsible. As an example, we quote a batch of 17 papers, in 11 of which no marks whatever were obtained, and of the remaining 6 there were none with sufficient marks to pass. But there were a number of excellently taught classes; for instance, we may mention one comprising 18 students, all of whom would pass, and nearly all in the 1st class, the marks reaching between 60 and 70 per cent. of the maximum.

As regards the general character of the work, contracted methods of multiplication and division have not yet got much hold of candidates in either stage. Fractional and negative indices require to be steadily worked at. Candidates are now getting more expert in the use of squared paper, but there are still too many examples of badly chosen scales and of figures too cramped, either in one or both directions.

If teachers would recollect that our object is to make students think for themselves about a problem and not merely to work mechanically by *rules*, there would be much more success. On the whole, however, it may be said that new questions, never asked before, were answered fairly well.

Group III.—Physics.

Board of Examiners.

VIII.a. Sound
VIII.b. Light
VIII.c. Heat
IX. Magnetism and Electricity
XXIII. § 1. Physiography
Section 1 of the Elementary Stage

H. L. Callendar, M.A., F.R.S. *Chairman.*
J. J. Thompson, M.A., F.R.S.
A. W. Reinold, M.A., F.R.S.
W. Watson, B.Sc., F.R.S.

SOUND, LIGHT AND HEAT.

EVENING EXAMINATION.

The standard of the answers in the Elementary Stage was well up to the average of previous years. The standard reached in the Advanced Stage was rather less satisfactory, and did not appear to indicate sufficient improvement in the style and character of the teaching, especially in the Heat section. This was shown by frequent vagueness of statement or description, and weakness in the quantitative application of laws and formulæ to practical cases. Many of these defects appeared to be due to insufficient grounding in geometry and algebra, and in the fundamental ideas of mechanics, which are so essential to the proper understanding of physics.

Honours.—Part I.

It may be remarked that nearly all the candidates whose answers were of any value were familiar not only with the notation, but also with the elementary methods of the calculus. Proofs in which the elements of the calculus are assumed are generally so much easier and shorter than the circuitous devices employed for avoiding the explicit use of a differential coefficient, that the quality of the answers would probably be improved, without adding to the difficulty of the examination, if the calculus were not formally excluded from the syllabus, provided that it were understood that simple applications only would be set

Honours.—Part II.

There were no candidates in Light, and very few in Sound or Heat. About half the candidates did fairly, but there was no conspicuous merit, and the number was too small to permit any general conclusions to be drawn.

DAY EXAMINATION.

Elementary Stage.

The answers to this paper were very creditable on the whole.

ADVANCED STAGE.

In Sound the answers in general were too vague and superficial, and not up to the standard of the Advanced Stage.

There were many more papers in the section devoted to Heat than in Light and Sound together, but the extent of knowledge shown in many cases was extremely vague and superficial. A great deal of ground has been covered, but only in an elementary way. It seemed as though a large number of elementary students had been sent in on the chance of some of them scraping through. The work was particularly weak from the practical or experimental side. In describing experiments, essential precautions were omitted, and unimportant points exaggerated. It would appear advisable to exact a more extended course of practical work of the advanced students.

ELECTRICITY AND MAGNETISM.

EVENING EXAMINATION.

The papers as a whole were fairly well answered both in the Elementary and the Advanced stages, though there were a number of weak candidates. Descriptive questions, such as those relating to the Leclanché cell and the Induction Coil, were as a rule the best answered. Questions involving precise definitions, or mechanical principles, or algebraic calculations, were less often attempted, and often badly answered. It is essential, especially in the advanced stage, that the students should have a good foundation of algebra and geometry, and some knowledge of the fundamental principles of mechanics.

Very few took the Technical section of the paper, and of these some answered questions both in the Voltaic and Technical sections. These students showed weakness in the fundamental principles, and especially in the Frictional section. Their descriptions of apparatus were often remarkably vague and inexact.

HONOURS.—PART I.

The papers sent in were on the whole fairly good, 45 per cent. obtaining more than half marks.

HONOURS.—PART II.

The number of candidates (6) was too small to allow of any general conclusions being drawn. Some of the candidates showed a tendency to reproduce passages of the text-books from memory, without, as other parts of their answers showed, having understood them. The work sent up by a few of the candidates was exceedingly good.

DAY EXAMINATION.

The number of candidates in the Elementary stage was only about a quarter of that in the advanced stage. The elementary papers as a whole were fair, but a large proportion of the advanced candidates had not really progressed beyond the elementary stage. The majority of the candidates showed a certain capacity for memorising formulæ, but few showed any power of applying them correctly or of dealing with algebraic symbols in a sensible way. The conclusion drawn from the advanced papers was that the students had not done sufficient mathematics.

PHYSIOGRAPHY, SECTION I. OF THE ELEMENTARY STAGE.

EVENING EXAMINATION.

The general character of the answers was well up to the standard of previous years.

DAY EXAMINATION.

As a whole the papers were good, but the standard reached in different schools was very unequal. Experimental knowledge was generally deficient, but the questions which could be answered by reading alone were well answered. Diagrams and descriptions of apparatus were generally poor. The chemistry questions were generally well answered.

Unworkable methods were often given, as evaporating the water in a closed flask.

Group IV.—Chemistry and Metallurgy.

Board of Examiners.

X. Inorganic Chemistry
X.*p.* „ „ (Practical)
XI. Organic Chemistry
XI.*p.* „ „ (Practical)
XIX. Metallurgy
XIX.*p.* „ (Practical)

W. A. Tilden, D.Sc., F.R.S., *Chairman.*
W. R. Dunstan, M.A., F.R.S.
W. H. Perkin, Ph.D., F.R.S.
W. Gowland, Assoc. R.S.M.
Sir W. C. Roberts-Austen, K.C.B. F.R.S. (*Honorary*).

INORGANIC AND ORGANIC CHEMISTRY.

INORGANIC CHEMISTRY, THEORETICAL.

EVENING EXAMINATION.

Elementary Stage.

The answers at this stage were fairly good. At the same time an impression has been produced that the papers this year are rather below the usual standard. It is, perhaps, to be expected of beginners that framing answers to questions which involve the application of principles should prove more difficult than to those which require merely a knowledge of facts; but when experimental details have been supplied in the syllabus there is little excuse for the teacher who ignores them.

Last year it was remarked "that a large number of candidates state that quicklime is calcium carbonate." The same curious mistake is again quite common, as well as several others which seem to be perennial. Judging from the frequency with which sulphuretted hydrogen is said to be obtained by burning sulphur in hydrogen, it seems as though this fallacy is still being taught. Similarly the idea that red hot copper decomposes steam and that a mixture of equal volumes of nitrogen and oxygen is nitric oxide seems hard to get rid of.

With regard to the "Alternative Elementary" the papers presented the usual characteristics. There is evidence that the candidates have seen a good many experiments, but the descriptions given are often very poor, and the sketches of apparatus miserable. The cause of luminosity of a gas flame is generally misunderstood. But apart from other mistakes for which the teacher is not necessarily responsible, it is evident that the now discredited doctrine of the preferential combustion of hydrogen in a hydro-carbon flame is still too generally taught.

Advanced Stage.

In conformity with the experience of many years past, which has found expression in the annual reports, the "advanced" papers compare very unfavourably with the "elementary."

It cannot be regarded as satisfactory that candidate after candidate should name chlorine, nitric acid, chromic acid, phosphorus pentachloride, hydrogen peroxide, ozone and sodium carbonate as reducing agents, and should state that hydrogen sulphide in the act of precipitating mercury, copper, or cadmium from a solution is exercising a reducing action.

The illustrations given of the reducing action of carbon, hydrogen and sulphuretted hydrogen, even when legitimately adduced, were generally very poor, and seemed to indicate that the special operation referred to in the question had never been properly explained to the students.

The Examiners further remark that it does not seem to be understood that these questions are addressed to students who are supposed to have some practical acquaintance with the industrial applications of chemistry, and that they cannot be answered by attempts to turn to account imperfect recollections of lecture experiments with vague references to furnaces chimneys, and flues. Scarcely one candidate was able to mention the impurities usually present in commercial hydrochloric acid, and the means of detecting them, and nearly all stated that sodium carbonate was the sole constituent of soda ash. Many also seemed to imagine that metallic sulphides when heated yield the metal and free sulphur as sulphur dioxide, without reference to the necessity for a reducing agent. Candidates who propose to attempt questions in this section would do well to endeavour to understand the principles which underly the processes, and to confine their attention to the careful study of one or two branches of chemical manufacture rather than to range over a number of the superficial accounts of commercial operations which appear in the pages of the usual text books.

Honours.

In Part I. there were a few good papers but the remarks in last year's report are equally applicable to this year. "There is evidence in many of the papers that the candidate has attempted to learn difficult sections of the subject by heart before having mastered thoroughly the rudiments." In fact, the majority of the candidates are only prepared for the "Advanced" stage.

In respect to Honours, Part II., it is sufficient to say that of the fifteen candidates who presented themselves two were recommended for a First Class and two for a Second Class.

Inorganic Chemistry—Practical.

Elementary Stage.

The first exercise, which involved a determination of loss of weight on heating a solid (a carbonate), was well done, and gave evidence that the students were generally practised in the operation of weighing.

The collection and measurement of the gas evolved on mixing the same powder with dilute sulphuric acid was less satisfactory. For a gas which, like carbon dioxide, is somewhat soluble in water, the vessel for evolution should be large enough to contain it all, and air only should be driven into the collecting vessel. With regard to a third Exercise the experimental attempts very generally failed altogether, as few students seem to have been shown how to estimate, even roughly, the solubility of a salt in water. A few only obtained good results.

The written paper was pretty well done on the whole, but the difficulty experienced by so many candidates in describing experiments made by themselves seems to indicate, either that they had made no experiments at all, or had not been taught to observe carefully.

Advanced Stage.

The answers to the written part of the examination were, as usual, very weak. The equations written down were often absurd, and the statement that hydrogen is the gaseous product of the action of nitric acid on metals occurred far too frequently.

The most striking feature in this examination was the serious falling off in ordinary qualitative analysis and the knowledge of analytical reactions.

This is possibly due in part to the agitation which has been going on during the last two or three years in favour of introducing quantitative forms of experiment in teaching chemistry. That movement, though excellent in principle, seems to have induced many teachers to adopt methods which appear to the Examiners to be unjustifiably rough, and bad in principle.

Honours.—Part I.

On the whole satisfactory, though in a certain number of cases bad methods were used for the estimation of the available manganese.

Honours.—Part II.

One candidate produced a thesis embodying the results of research carried on under the direction of his teacher, and having satisfied the Examiners in ordinary qualitative and quantitative analysis, was allowed a First Class. Of the remaining candidates, nine obtained a Second Class. Great weakness was displayed in dealing with the persulphate (ammonium or potassium) supplied on the last day of the Examination. Though it was not surprising that many failed to identify the salt, it was not creditable that so many candidates should have failed to recognise its oxidising properties.

Organic Chemistry.—Theoretical.

First Stage.

The candidates in this subject seem to have been well taught on the whole, and their answers call for no special comment.

Second Stage.

As usual the work in this stage was satisfactory, very few weak papers being sent in.

Organic Chemistry.—Practical.

The First Stage requires no comment, except that a little more care should be given to the tests for oxalic acid, which is not sufficiently indicated by the formation of a precipitate with calcium chloride.

In the Second Stage the work was satisfactory, except where glycerol was concerned. The attempts to ascertain the best solvent for recrystallising the substance A showed intelligence in a fairly large number of cases.

In the work of candidates for Honours the identification of the two carbon compounds was successfully accomplished in a large proportion of cases, and the determination of the proportions very fairly done. The preparation of a derivative from the acid was less successful. The results may be regarded as on the whole satisfactory.

DAY EXAMINATION.

Inorganic Chemistry.—Theoretical.

In the Elementary Stage the papers presented few points for special report, and the questions were, on the whole, well answered. The papers sent in by candidates at the Advanced Stage, however, were for the most part hopelessly bad, and it seems incredible that they should have succeeded in passing the Elementary Stage before taking the Advanced. The theoretical questions proved to be quite beyond the knowledge of the candidates, and scarcely one showed any sign that he had ever heard of such subjects as dissociation in gases or constitutional formulæ. The answers in the technical section were generally puerile, and essentials

seem to have been neglected, while non-essential circumstances have been brought into ridiculous prominence. In describing the reduction of copper, for example, one candidate after another would insist on the greenness of the pole without showing the slightest knowledge of why copper is poled. One even stated that the pole should be painted green.

The great majority of these candidates require a good grounding in such facts as are generally considered to belong to the Elementary Stage. From the papers it would appear that they have been getting up processes without understanding the principles on which they are based; and the same candidate who says that copper with nitric acid yields hydrogen would be capable of giving a fair account of the electrolytic production of caustic soda, or the extraction of iodine from kelp, either of which operations it is more than probable he had never seen.

Inorganic Chemistry.—Practical.

Elementary Stage.

The practical work was, on the whole, good, especially the determinations of loss of weight. For collecting and measuring gas an unsuitable form of apparatus was often used, and then failure resulted. In a third exercise nearly all recognised the chlorine which was evolved, but the descriptions of the residue were too often unsatisfactory, because the candidate would not describe what he really saw, but something which he imagined he ought to see. The evolution of chlorine from a black powder when mixed with hydrochloric led a good many to conclude that the powder was manganese dioxide, even when the substance actually in their hands was peroxide of cobalt or of nickel.

Advanced Stage.

Last year it was found that the qualitative work was superior to the quantitative. This year it seems that the order is inverted, and the qualitative work is generally inferior. Whatever may be the cause of the change the fact remains that the careful and exact qualitative analysis performed by candidates at these examinations a few years ago has disappeared, and, so far as can be seen at present, with little compensating advantage in other directions. Extreme weakness is also manifest in a large number of the papers relating to the theory of laboratory processes.

METALLURGY.

Theoretical.

Elementary Stage.

The number of papers sent in was only 96, a diminution of 19 as compared with last year. The answers of the candidates generally, however, showed a marked improvement in the teaching. The percentage of passes in the first class was the highest yet reached, and there was, at the same time a great reduction in the number of worthless papers. A better acquaintance than hitherto was also shown by most candidates with the metallurgy of the metals other than iron and steel; but in some schools, as already pointed out in previous reports, these metals are neglected and consequently inaccurate and imperfect answers are more frequent in them than in the others.

Advanced Stage.

The number of papers was 154 against 130 in 1901, and 42 obtained first class marks. The papers of a considerable number of candidates afforded satisfactory evidence of careful teaching, and attained a higher average standard of excellence than has hitherto been reached in this stage. Yet still too many showed imperfect preparation especially in the metals other than iron and steel.

Honours—Part I.

There were 28 papers in this stage as compared with 37 in 1901. One paper was of exceptional merit, but the great majority of the others were more disappointing than usual. Only 8 obtained more than 69 per cent. of the total marks.

In the recognition of specimens too much ignorance of common metallurgical materials was displayed. It would seem as if some of the candidates had neglected to test the specimens for hardness, or they would not have confounded copper regulus with ferro-manganese and magnetite, or cerussite with quartz.

Honours—Part II.

There were ten candidates for examination in Paper I.

It is extremely satisfactory to note that each year there is a marked improvement in the standard reached in this stage. A weak point, however, was the avoidance by the candidates generally of the practical question relating to furnace building, the construction of flues, and working drawings. In future, special importance will be attached to good answers to these questions. In this connection it may be pointed out that a longitudinal section and a plan are not the only working drawings which are required for the building of a furnace.

Practical.

Elementary Stage.

There was a further diminution of the papers in this stage compared with last year, the number having fallen from 75 to 64. The character of the work done was practically the same as in 1901.

In the preparation of the alloys the chief defects were precisely those which were pointed out at length in the last report. In the extraction of copper from copper regulus, and of lead from galena and cerussite, many of the candidates failed to obtain more than a part of the metal present in the materials, owing, either to the use of unsuitable crucible charges, or of reducing agents alone without fluxes. The old fault of weighing the metallic buttons with adherent slag was a common source of loss of marks. There was, however, much less defective work than in the past.

Advanced Stage.

The number of candidates showed a slight increase, 133 having been examined, as against 122 last year.

There was a slightly lower percentage of passes in the first class, but the standard reached by the candidates was much higher than hitherto; about half obtained not less than 80 per cent. of the total marks, and the work of some was most praiseworthy. There was, too, a decided improvement in the laboratory work as a whole, the errors to which attention had been called in previous years being much less frequent than usual. A weak point was a tendency to use unnecessarily high temperatures for the reduction of the ores.

Honours—Part I.

There were only 48 candidates, the number last year being 55. The standard reached was lamentably low.

Honours—Part II.

Only six of the seven candidates who had qualified for admission to the Examination in practical work in the Metallurgical Laboratory of the Royal College of Science presented themselves. Of these one passed in the First Class.

Insufficient experience in laboratory work was, as usual, the principal cause of the failure of the others, and it is to be hoped that they will come up for examination again next year.

Finally, it may be remarked, that if the results of the examination be considered as a whole, notwithstanding the weak points set forth above, it will be found, that steady progress continues to be made in the teaching throughout the country, and that a wider and sounder knowledge of metallurgy is year by year being acquired by a large number of students and others engaged in the work in the chief centres of the industry.

Group V.—Geology, Mining and Physiography.

Board of Examiners.

XII. Geology, XIII. Mineralogy, XVIII. Mining, XXIII. Physiography: J. W. Judd, C.B., LL.D., F.R.S., *Chairman.* Sir J. N. Lockyer, K.C.B., F.R.S. C. Le Neve Foster, D.Sc., B.A., F.R.S.

GEOLOGY.

EVENING EXAMINATION.

There was a slight falling off in the number of Elementary papers, but the numbers of Honours and Advanced were nearly maintained. There was a general improvement in the answers, which was more marked in the case of the Advanced and Honours papers than in that of the Elementary stage. Considering the very excellent teaching there now is in Geology, it is to be regretted that the number of classes in this subject is not larger.

Elementary Stage.

There was a very decided improvement in the answers to Mineralogical and Petrographical questions, but the Stratigraphical questions were dealt with in a very unsatisfactory manner. The questions demanding a diagram, and some knowledge more real than could be obtained by reading up the subject in a text-book, were far from good. In explaining the relationship of rock masses, it would appear that the teachers had done little more than to reproduce on the blackboard the sections given in books, without any explanation of the real meaning of such sections.

Advanced Stage.

The answers in this stage were, as a rule, excellent, and afforded evidence of systematic and accurate teaching. The questions relating to Economic Geology were especially well answered, and it was evident that there had been practical teaching, some times of a very thorough kind. The least satisfactory portion of the work was the palæontological answers, but in this part of the subject the want of previous biological teaching no doubt handicapped the teachers.

Honours.—Part I.

As was the case last year, the Honour papers, Part I., were highly creditable. The answers to the questions in Physiographic Geology showed a fair knowledge of Physics and Chemistry, and, at the same time, gave evidence of wide reading. The weakest portion of the papers were those in which practical knowledge of the use of the microscope was required though it was evident that in some instances there had been sound instruction given in connection with the use of the instrument.

Honours.—Part II.

The papers in this stage were even more excellent than those of last year, and the candidates brought up to South Kensington for the Practical Examination showed sound knowledge. It was evident that most of them had worked in the field, and had an exact and minute knowledge of the geological structure of certain districts. It is noteworthy that certain

candidates have come up year after year in this stage and have persevered until they succeeded in obtaining a First Class. The tests they were able to pass in drawing sections from the Geological Survey Maps, and in identifying rocks and fossils, both in hand specimens and under the microscope, show that they had worked with great zeal and success in geological study.

DAY EXAMINATION.

It would be impossible to draw any general conclusion from the examination of so small a number of papers, but the following remarks are suggested by their perusal. There was a want of exactness about the Elementary answers—*e.g.*, in their explanation of the term "Vitreous," in the omission of any reference to the difference of crystalline form in Calcite and Aragonite, in the vague ideas shown as to the conditions of formation of Plutonic rocks, which indicate poor teaching. There was little power of reasoning shown in the answers to the question about the changes which a fossil must have undergone.

The Advanced papers, as in the Evening Examination, were on the whole very good. The questions on the density of the earth, on the nature and origin of amygdaloidal rocks, and on "inversion" were especially well answered. The questions in general geology were better answered than those demanding exact knowledge of petrology or palæontology.

MINERALOGY.

This subject being so well and successfully taught, both theoretically and practically, it is to be regretted that the number of classes in it is so small. The Honours Papers in Parts I. and II. reached the same standard of excellence as last year, while the Advanced Papers were on the whole admirably done. The number of Elementary papers was again greatly reduced.

PRINCIPLES OF MINING.

The following Table gives a comparison

Year.	Number of Candidates.				
	Elementary	Advanced.	Honours Part I.	Honours Part II.	Total.
1901	721	825	327	78	1951
1902	902	789	231	72	1994

between this year and last, and shows an increase of forty-three in the total number of candidates; this result is due to the larger number of entries in the Elementary Stage, which more than compensated for the diminutions in the other stages.

Judging by the answers to the papers, I have no hesitation in saying that the mining classes are doing good and useful work in various parts of the kingdom; it is true that there were many failures in Honours Part I., but I attribute this more to ill-judged ambition on the part of the candidates than to faulty teaching. Very many who attempted the Honours paper ought to have rested satisfied with trying to answer the Advanced questions.

It is evident from some of the papers that familiarity with an appliance or a process does not always enable the student to describe it properly. Many candidates say, "I have done this," or, "I have seen this" and, nevertheless, write poor and incomplete answers. They have had the opportunity of learning by the eye, and have failed to profit by it. I would

recommend teachers to practise their pupils in writing descriptions of the operations they are engaged in, and of the tools and appliances they are handling; the teacher should then criticise the written essay, point out all deficiencies and inaccuracies, and finally ask the pupil to rewrite it. In other words, the teacher's business should consist far less in stuffing the young miner with facts, than in making him learn how to observe and how to record.

I am in no way inveighing against teaching by lectures and text-books. I simply want these aids to learning to be relegated to their proper sphere. They should be looked upon in the same light as guide-books to a foreign country, which tell the traveller what places, buildings, and works of art most deserve his attention, and give him useful explanations concerning them. The guide-book simply helps the traveller, but does not enable him to dispense with actual observations on the spot.

PHYSIOGRAPHY.

There was a considerable falling off in the numbers both in the Evening and the Day Examinations, as compared with last year, this being probably due to the teachers electing to have their work tested by inspection rather than by examination. This year the decline in numbers affected the Advanced as well as the Elementary Stage. There were still, however, over 3,600 Elementary and more than 2,700 Advanced papers in the ordinary classes, and more than 700 Advanced papers from Training Colleges. The number of Elementary papers from training Colleges, both in the Evening and Day Examination, amounted to only 25.

EVENING EXAMINATION.

Elementary Stage.

The answers to the questions in this stage were quite up to the average of former years. There is evidence that the series of experiments suggested in the syllabus are being shown to the students, and, in a few cases, actually performed by them. But, at the same time, it is manifest that full use is not being made of these experimental illustrations, by the proper inferences from the facts witnessed not being clearly pointed out. Thus many of the students, who had evidently seen the experiment of sodium thrown into water, and correctly described what they witnessed, altogether failed to grasp the facts of decomposition and recombination, attended by the development of heat and the production of an oxide dissolved in the water.

Advanced Stage.

As in former years, there is evidence that the teaching in the Advanced Stage has been mainly confined to Astronomical subjects, and that little had been done to extend the knowledge of the students on Meteorological and other Terrestrial phenomena. The want of acquaintance with instruments employed in observing terrestrial phenomena was very marked. The accounts given of these instruments and of their mode of employment was, in nearly all cases, evidently derived from books, and very few had seen and made themselves familiar with the parts and uses of a good standard barometer. On the other hand, theoretical questions like Boyle's law were very correctly stated, though there was a total want of power to apply this and similar principles to the explanation of phenomena described. There was, in fact, a striking lack of power to reason for themselves from known facts on the part of nearly all the candidates. The Astronomical questions were generally well answered, so far as a knowledge derived from text-books would assist the candidates. The least satisfactory answers were those on the appearance of Jupiter and on variable stars. The account of the movements of the planets and of the cause of precession and nutation showed the result of much good teaching.

Honours.

Of the 50 papers sent in for Honours, very few were of a character to entitle the candidate to such distinction. The great majority of these papers gave no evidence of any special reading or study which would qualify the candidates for dealing with the more difficult problems of the subjects. With the exception of five or six papers, the candidates in this stage showed no higher attainments than those in the Advanced stage, while some, it may be feared, could not have passed the Elementary. Even among the few who were better qualified, it was nearly always found that they had a knowledge of only one side of Physiography—being weak either in the Astronomical or the other parts of the subject.

DAY EXAMINATION.

The diminution in numbers in the Day Examinations as compared with last year was about in the same proportion as in the Evening Examinations. There were about 1,320 Elementary and 830 Advanced papers, exclusive of those from Training Colleges. The standard of excellence for the Day Examination appears to be somewhat higher than for the Evening Examination.

Elementary Stage.

In this stage the improvement in the style of answering was well marked. There was more individuality, indicating a cultivation of the reasoning faculties in the answers, and the questions selected showed that all parts of the subject had been taught in most of the schools. The results would have been still better if the candidates had more carefully considered the terms of the question. Many of them had evidently glanced at the question to see what it was about and then written all round the subject. Teachers would find the setting of one or more test examinations an excellent means for correcting this practice and of teaching examinees how an examination paper should be dealt with.

Advanced Stage.

On the whole these papers show a decided improvement, both on those of last year and of the Evening Examinations. While some of the papers exhibit evidence of learning by rote, others, especially in the portions relating to Astronomy, show that the candidates had been taught to think for themselves.

Group VI.—Biology, Physiology, and Hygiene.

Board of Examiners.

XIV. Human Physiology XV. General Biology	L. C. Miall, F.R.S., *Chairman.* J. B. Farmer, M.A., F.R.S., F.L.S.
XVI. Zoology XVII. Botany	F. Gotch, M.A., F.R.S.
XXV. Hygiene	J. L. Notter, M.A., M.D.

HUMAN PHYSIOLOGY.

EVENING EXAMINATION.

Elementary Stage.

The work in this stage was not as good as that of the preceding year, probably through the circumstance that the new features which the present Board of Examiners have introduced are found to offer some little difficulty. As stated in the report of last year, the essence of these new features is the demand made upon candidates to apply their knowledge to familiar

examples not especially mentioned in text-books, and to be acquainted with the practical aspects of a few of the most important points indicated in the syllabus. It appears that at present the teaching has not accommodated itself to these conditions, and it is very desirable that teachers should realise the importance of the practical demonstrations here referred to. The number of candidates reaching a first-class standard was only 31 per cent. as compared with 49 per cent. in 1901, whilst 26 per cent. were rejected as compared with 18 per cent. in 1901; there were, however, several indications that in certain schools the work was extremely good, thus out of sixteen consecutive papers there were fifteen who reached a first-class standard.

Advanced Stage.

The results of the examination in this stage showed considerable improvement as compared with those of the previous year. In the report for 1901 attention was drawn to the satisfactory character of the Elementary stage work, and probably these candidates on passing into the Advanced stage, were much better grounded than those of the preceding year. In 1901, only 5 per cent. of the candidates attained the standard of a first class, and 43 per cent. were rejected; in the present year over 8 per cent. were up to first-class standard, whilst less than 30 per cent. were rejected. As regards the rejections, some of these were upon papers which would have utterly failed to qualify in any Elementary stage, and these cannot be regarded as written by serious Advanced stage candidates. If such hopeless papers are eliminated, the number of rejections of those who attempted to answer an adequate amount of questions is reduced to about 15 per cent. Candidates should not present themselves for the Advanced stage without having that knowledge of the fundamental principles of the subject which the Elementary stage demands. A noticeable failing of a general character is that due to the difficulties which candidates appear to experience in connection with practical work; the failing here alluded to is especially prominent when descriptions are given of microscopic structure; it is apparent that the practical study of the minute structure of the tissues is still not realised and that too much reliance is placed upon learning descriptions and figures from text-books.

Honours.—Part I.

There were 11 Candidates for Honours as compared with 15 in the previous year and 6 in 1900. Of these, four sent up papers of sufficient merit to justify a further practical examination.

Honours.—Part II.

Two candidates sent in papers for this part of the examination. It must be understood that the standard in Honours Part II. is very high and that it is expected that a candidate shall display considerable knowledge of at least one of the questions. As neither of the candidates displayed knowledge of this character it appeared impossible to make any recommendation; each candidate obtained less than 40 per cent. of the total marks.

DAY EXAMINATION.

The poor results of this examination last year made it advisable to change the character of the written examination in one respect; instead of giving twelve questions only ten were set, the maximum number of questions to be answered remaining as before at eight. It is inadvisable to give any great latitude of choice in an elementary examination; the fact of having to exercise a choice is apt to be confusing in the case of young candidates and provided that the questions set are fair and adapted to the stage of knowledge required the examination results with more restricted choice are likely to prove far more satisfactory. Whether this factor had any potency

or not, it is undoubted that the results this year are much better than those of the previous year. In 1901, only 13 per cent. of the candidates reached first-class standard and 30 per cent. were rejected, whilst in the present year 32 per cent. attained the first-class standard and only 18 per cent. failed.

Advanced Stage.

The papers in this stage showed, like those of the same stage in the Evening Examination, a considerable improvement over those of last year, and compared quite favourably with the Evening Examination result. Thus 12 per cent. of the candidates attained the first-class standard, whilst only 28 per cent. were rejected.

GENERAL BIOLOGY.

EVENING EXAMINATION.

Elementary Stage.

Section I.

For the first time since Section I. was instituted a large proportion of the candidates have been taught on good lines, and will be distinctly better for their training. The animals of the syllabus have been studied less successfully than the plants. The number of the candidates is still very small.

Whole Elementary Stage.

Most of the candidates have not been really trained, but merely supplied with information. Such answers as most of these could be given by persons who had never attentively examined any plant or animal.

Advanced Stage.

Want of real knowledge as distinct from book-knowledge is the ground of many failures.

DAY EXAMINATION.

Elementary Stage.

Section I.

There is a distinct improvement in the work on plants and the most urgent need now is to bring the work on animals and the physiology up to at least the same level. The teachers continue to explain and draw objects, which their pupils have never been allowed to observe.

Whole Elementary Stage.

There is an advance upon last year's papers, and a fair amount of honest, intelligent teaching has been done. The text-book is still relied on far too much, and independent observation is too little practised. The plants are studied much more thoroughly than the animals.

Advanced Stage.

The questions were either answered directly out of text-books or not at all. For example, no one attempted to describe a single gill-chamber, but all repeated the general description of the book. The minute structure of the retina was brought in more than once. Book-work, without actual study of plants and animals, would yield just such answers as these.

ZOOLOGY.

Elementary Stage.

The questions were very elementary and call for little explanation. As in past years the chief deficiency is that of immediate knowledge of the objects. The descriptions of the neck-vertebræ of the bird, as well as of the movements of the living crayfish and hydra were particularly defective. It is noteworthy that many candidates gave Greek names for every joint of the walking leg of the crayfish. This is apparently one of the things first learnt and best remembered It is continually brought in without being asked for.

Advanced Stage.

The answers abounded in technical descriptions taken directly or indirectly from text-books, but were generally deficient in indications of personal acquaintance with the objects. It is particularly disappointing to find that the teachers have not made better use of one recent change in the syllabus. Two alternative groups of very common animals, one marine, the other freshwater, were proposed, and it was hoped that the teachers would help their classes to study the living animals, as well as to dissect and make preparations. They have generally preferred to show pictures, and repeat descriptions taken straight from a book. Such zoology as this has neither educational nor practical value.

BOTANY.

The general result of the whole examination tends to show the great need of insisting on more first hand attention being paid to the objects dealt with in the class. There is evidence that characters are often given in diagrammatic form, and that these are committed to memory, without any real knowledge of the objects, or class of objects, to which they refer. Instances of this are cited in the detailed reports dealing with the various stages of the examination. It is, however, satisfactory to note that much progress has obviously been made in simple physiological observations. It is to this feature that the improvement which is becoming evident in the teaching of the subject is to be largely attributed.

HYGIENE.

EVENING EXAMINATION.

Elementary Stage.

For the elementary part of this examination, only 1,640 papers were sent in. This is a very large falling off compared with previous years. The marked and progressive improvements in this examination, and the interest taken in the subject by the students, showed that good work was done. During the last few years more and increasing care has been taken in the preparation of the classes, and sound practical knowledge has been imparted.

As in former years, the scope of the examination is limited to really test the student's knowledge of ordinary household hygiene and to the rules of sanitary science, that will enable them to observe the conditions necessary to ensure a healthy house and surroundings. In Section 1., Elementary Stage, 268 papers were sent in. Of these, 75 per cent. past and 25 per cent. failed.

Advanced Stage.

After a careful perusal of the Advanced papers, I am of opinion that more time ought to be given to practical subjects, such as disinfection and the arrangements for house drainage.

DAY EXAMINATION.

Elementary Stage.—Section I.

For this examination 244 papers were sent in. Of these 163 passed and 81 failed. Those papers to which high marks were given were excellent, while those which obtained lower marks showed evidence of careful training, and were above the average of former years. The pupils appear to have had good practical training in the principles of the science. The results of this examination are most encouraging, and indicate a progressive improvement, not only in the students, but also in the practical teaching they receive. The tendency to answer the question in the same words or to repeat a lesson taught to them is less in this examination than in previous years, and this applies not only to this section but to the whole examination. As the teaching comes to be more practical, the tendency to answer questions in the same words will disappear. The teachers should endeavour to illustrate, as far as possible, their teaching by practical demonstrations; a mass of information learnt by rote is of little practical use to students.

Advanced Stage.

For this part 451 papers were received. Of these 100 obtained first class, 317 second class, and 34 failed. The answers were satisfactory on the whole and above the average of former years. The teaching has decidedly improved in every way. The candidates who obtained first class showed much intellectual power of expression, and, indeed, logical treatment of difficult subjects.

Honours.—Part I.

Thirty-seven papers were sent in. Of these only 40 per cent. passed and 60 per cent. failed.

Part II.

In this part of the examination twenty-one papers were sent in. Of these 9·5 per cent. obtained a first class, 47·8 per cent. a second class, and 41·7 failed to qualify. These results are unfavourable compared with those of previous years.

It should be remembered both by teachers and students that this part of the examination is meant for very advanced students, and that the standard is proportionately high. Many papers showed little knowledge beyond what is expected in well-prepared elementary students, and these were not a few.

AGRICULTURAL SCIENCE AND RURAL ECONOMY.

In the Elementary Stage of the Evening Examination, 40 per cent. of the candidates passed in the first class. In the same stage of the Day Examination, 22 per cent. passed in this class. Of the total number of candidates, 31 per cent. passed in the first class. This is a distinctly smaller proportion than has been usual in recent years.

In the Advanced Stage the results of the Evening and Day Examinations were very different. As usual in recent years the proportion of failures was much greater in the Evening than in the Day Examination, while the proportion of both first and second class passes was greater in the Day Examination. Of the total candidates, 15 per cent. passed in the first class.

In the Honours Stage fifteen candidates entered; of these four passed sufficiently well in the paper examination to warrant their being invited to attend a subsequent Practical Examination at South Kensington. Two of the four selected Agricultural Chemistry as their special subject, and

passed successfully the examinations in qualitative and quantitative analysis, and the *viva voce* upon agricultural foodstuffs and manures. The other two candidates selected Agricultural Hygiene ; of these one passed the *viva voce* and paper examination on the subject, and one failed.

There are a few symptoms of improvement in the teaching given ; and in the present examination a few schools were able to describe the mode of demonstrating the formation of starch in a leaf, and to write intelligently on the subject. The bulk of the teaching is, however, still of very poor quality. Nothing seems to be exactly or fully taught, and a scholar is generally unable to write on any subject without danger of making serious mistakes or exhibiting such a confusion of ideas that the examiner is sorely perplexed to decide whether he can be credited with any real knowledge at all.

5 (*b*) EXTRACTS FROM THE REPORTS OF THE EXAMINERS ON THE RESULTS OF THE SCIENCE EXAMINATIONS IN TRAINING COLLEGES, 1902.

MATHEMATICS.

EVENING EXAMINATION.

No special paper was set for Training Colleges in Stages 1—3 of Mathematics.

Fourth Stage.

Only one paper was sent up; it consisted of very poor attempts at four of the questions in Section I., whilst Section II. was not attempted.

Fifth Stage.

There were 14 Candidates; two answered very well, and nearly all the rest fairly well. There were no answers in Descriptive Geometry.

Sixth Stage.

There were two candidates in this stage; both of whom sent up fairly good papers.

Seventh Stage.

There were no Candidates.

DAY EXAMINATION.

Fourth Stage.

In this stage there was one candidate; his work just came up to the pass standard.

Fifth Stage.

In the single paper worked in this stage there were answers to parts of five questions in Section I., but no answers to Section II.

THEORETICAL MECHANICS.

EVENING EXAMINATION.

The remarks on the ordinary examination apply in general to these students also. The result of the examination is satisfactory. A large amount of good work was submitted, more, I think, than usual.

DAY EXAMINATION.

Part I.—Solids.

Elementary Stage.

Nine students in Training Colleges took the Elementary Paper; all of them sent up very good work.

Advanced Stage.

Thirty students in Training Colleges took the Advanced Paper. The work on the whole was good, *i.e.*, the average of the marks was high. Some of the work was very good, and all of it gave evidence of careful teaching.

PART II.—FLUIDS.

ELEMENTARY STAGE.

Twenty-nine students in Training Colleges took this paper, and sent up very good work.

ADVANCED STAGE.

The Paper was not taken by any student in a Training College.

SOUND, LIGHT, AND HEAT, AND MAGNETISM AND ELECTRICITY.

Generally speaking, the papers sent in from the training colleges were of a better quality than the papers from the other schools, especially in point of neatness and clearness of arrangement. The mistakes made in the individual questions were, as a rule, of the same nature as those made by other candidates.

EVENING EXAMINATION.

SOUND.

ADVANCED STAGE.

SECTION B.

In the questions relating to teaching methods the ordinary lecture experiments were described, without sufficient attention to practical details of instruction.

LIGHT.

ADVANCED STAGE.

SECTION B.

The description of the usual experiments was generally fair, but the points which they illustrated were not, as a rule, clearly brought out and arranged in a suitable sequence for a lecture.

HEAT.

ADVANCED STAGE.

SECTION B.

Descriptions of experiments were generally good, but the deductions to be drawn from them were not clearly put. The historical element should not be neglected in teaching, as it is very instructive.

MAGNETISM AND ELECTRICITY.

ADVANCED STAGE.

SECTION B.

The questions relating to methods of teaching were answered well by most of the candidates in one instance, whilst several good answers were received to the other two.

INORGANIC CHEMISTRY

As regards the theoretical part of the examination the standard, both in the Elementary and Advanced Stages, is about the same as that of candidates from other schools. The writing is generally superior and perhaps the English, but the lack of common sense is just as manifest; and in illustration it is only necessary to mention the substance of one answer, in which it is stated that coal gas is purified by passing it over silver sulphate, lead nitrate and nitric acid!

As to the laboratory provision for experiment in some colleges it is sufficient to mention that silver nitrate was described by not a few students as "a sticky substance in the form of a paste and of a brown colour." The questions set at both Evening and Day Examinations on subjects connected with the teaching of chemistry were in nearly every instance extremely badly answered. It was evident that the candidates had never thought seriously about such questions, and probably the course of instruction they had received had not been sufficiently detailed or systematic to supply the necessary ground-work. The Examiners desire to express again the opinion that the staff, appliances, and methods of teaching chemistry adopted in the Training Colleges call for serious attention.

PHYSIOGRAPHY.

The number of papers in the Elementary Stage (10 in the Evening and 15 in the Day Examination) was so small that it would be unsafe to draw any general conclusions from them. The prevalent mistakes were the same as in the papers from ordinary Science Classes which have already been reported upon.

EVENING EXAMINATION.

Advanced Stage.

The standard of the answers was about the same as last year, perhaps showing some improvement.

DAY EXAMINATION.

Advanced Stage.

The papers sent in for the Day Examination showed a slight improvement on those of last year.

HUMAN PHYSIOLOGY.

EVENING EXAMINATION.

Elementary Stage.

There were fourteen candidates, as compared with thirty-one in the previous year; the answers were quite good, and eleven candidates attained the first class standard; there was not a single rejection. As regards any special remarks upon the various questions, reference should be made to the details given in the General Examination Report.

Advanced Stage.

There were no candidates this year for this part of the examination.

DAY EXAMINATION.

Elementary Stage.

There were fifty-six candidates, as compared with seventy-one in 1901; the standard of excellence which was shown in the evening examination of this stage was fully maintained, and the results show a great improvement when compared with those of the previous year. The number of those who attained the level of the first class was thirty-seven, and only one candidate failed, whereas in 1901 only fourteen reached the first-class standard, and there were twelve rejections. The elementary examination is of a very simple character, but the Board of Examiners have modified it so as to include some reference to simple practical observations. Under these circumstances the value of the examination as a test is undoubtedly increased, and the results are thus particularly gratifying. Special details as regards the different questions are given in the report of the General Examination.

ADVANCED STAGE.

The number of candidates was considerably less than in the previous year, being only thirty-four as compared with sixty-nine. This diminution is probably associated with the elimination of the weakest of the possible candidates, for the results show much improvement. In 1901 only two out of sixty-nine reached the first-class standard; this year three out of thirty-four attained this level; moreover, whereas in 1901 there were twelve rejections, there were only four rejections in the present examination. In spite of this improvement it should be noted that, unlike the Elementary Stage, the number of candidates attaining the first-class level compares unfavourably with the number of those who obtained a similar class in the General Day Examination. One potent factor in causing this result is the inability of the candidates to answer satisfactorily a question from the compulsory Series 2. This series of questions has a direct bearing upon teaching capacity, and is, therefore, from the point of view of the Training Colleges, of no little importance.

GENERAL BIOLOGY.

EVENING EXAMINATION.

ELEMENTARY STAGE.

SECTION I.

For the first time since Section I. was instituted a large proportion of the Candidates have been taught on good lines, and will be distinctly better for their training. The animals of the syllabus have been studied less successfully than the plants. The number of the candidates is still very small.

DAY EXAMINATION.

ELEMENTARY STAGE.

SECTION I.

There is a distinct improvement in the work on plants, and the most urgent need now is to bring the work on animals and the physiology up to at least the same level. The teachers continue to explain and draw objects which their pupils have never been allowed to observe.

(WHOLE) ELEMENTARY STAGE.

There is an advance upon last year's papers, and a fair amount of honest intelligent teaching has been done. The text-book is still relied on far too much, and independent observation is too little practised. The plants are studied much more thoroughly than the animals.

BOTANY.

EVENING EXAMINATION.

ELEMENTARY STAGE.

The work was exceedingly good, and calls for no special comment. The errors in the weaker papers were similar to those set forth in the detailed report on the ordinary elementary examination.

ADVANCED STAGE.

No papers were sent in.

DAY EXAMINATION

Elementary Stage.

The work sent in was, on the whole, fair, but the level of real excellence was perhaps not so high as might have been expected.

There is evidence that too much reliance is still placed on book-work and blackboard diagrams, instead of on information derived by a thorough first-hand examination of the real objects. Teachers should remember that although it may not be possible to impart as many facts in a given time, yet the superior quality of knowledge acquired by personal investigation on the part of each individual in a class will tell whenever and however the know ledge thus acquired may be tested.

Advanced Stage.

The work sent in shows an improvement as compared with that of past years, but certain points still require far greater attention than appears to be paid to them.

Much more care is required in cultivating the faculties of observation and comparison. Thus, hardly a single candidate noticed the very striking order of succession exhibited by the stamens of the plant set for examination in their arrival to maturity. Again, no one seemed to be able to correlate a deciduous habit with other important facts in the relations of a tree with its environment. It is clear that the main thing which is lacking in the botanical training of candidates is the education in the use of their observant and reasoning faculties as directed towards the elucidation of the essential features, natural objects, and phenomena, and the various relationships existing between them.

HYGIENE.

EVENING EXAMINATION.

Elementary Stage.

Forty-one papers were received for this part of the examination. Of these 63·4 per cent. obtained first class and 36·6 per cent. second class; there were no failures. These results are almost precisely the same as last year.

Elementary Human Physiology.

The answers by all the students were excellent.

Advanced Stage.

One hundred and thirty students sent in papers for this part of the examination. Of these, 23 per cent. obtained first class and 77 per cent. second class. There were no failures in this part of the examination.

DAY EXAMINATION.

For this examination seventy-two papers were received in the elementary stage. Of these, 52·8 per cent. obtained first class, 47·2 per cent. second class, and none failed. This examination was extremely satisfactory. The students showed an excellent knowledge of the subject, and were carefully prepared. The style of the answers was good. There was not the use of the same phraseology in the answers—so evident when candidates repeat a lesson which has been taught them. On the contrary, the students appear to have given their own answers in their own words, and in many cases to have formed a true opinion.

The answers indicate not only a high order of teaching but also an intelligent and industrious class of students. There is evidently an increasing interest taken in the subject, which is very encouraging. The Training Colleges this year have sent in the best papers I have yet received for the Day Examinations, and show a distinct advance on previous years in the way the questions were answered.

Advanced Stage.

For this part of the examination 152 papers were sent in. Of these, 33·6 per cent. obtained a first class, 65·8 per cent. a second class, and 0·6 per cent. failed. The papers throughout were good.

The part of the examination relating to Methods of Teaching shows that good instruction has been given in the art of imparting knowledge to students, and that a systematic course of teaching exists on the methods of imparting knowledge to others in a clear and simple manner.

5 (*c*). EXTRACTS FROM THE REPORTS OF THE EXAMINERS ON THE RESULTS OF THE ART EXAMINATIONS, 1902.

GEOMETRICAL DRAWING.—*Examiner: H. W. O. Hagreen.*

The average quality of the papers worked at the Evening Examination was higher than in the corresponding examination last year. There is still evidence that, in many classes, lectures have not been sufficiently supplemented by supervision and correction of the student's own work.

At the Day Examination the average of geometrical draughtsmanship was creditable, but hardly so good as in past years. There was the usual evidence that the text-books had been studied, and that a great many students have very little idea of turning their knowledge to any practical account.

PERSPECTIVE.—*Examiner: H. Walter Lonsdale.*

An improvement is evident in the general quality of the work submitted for the Evening Examination, as compared with the corresponding one of last year.

This improvement is maintained in the Day Examination, an ability in readily applying their knowledge of the theory of perspective to the practical solution of problems presented in an unaccustomed form, being shown by an increased number of candidates.

FREEHAND DRAWING IN OUTLINE.—*Examiners: W. J. Donne and W. Norris, A.R.C.A. (London).*

The new conditions imposed this year—viz. "to be finished with a brush or pen," have produced some very satisfactory results.

There is a great variety of brush line and pen work, in some instances a very intelligent rendering is given, and in others an inexpressive, thin, and monotonous line.

MODEL DRAWING.—*Examiners: Martin A. Buckmaster, A.R.C.A. (London) and John Parker.*

The Examiners are of the opinion that there is a steady improvement in the standard of merit of the exercises submitted for examination, but the level of the work in the Day Examination is not so high as that of the Evening.

It is gratifying to note that fewer students are now presented without sufficient preparation for the present advanced character of the examination.

DRAWING IN LIGHT AND SHADE.—*Examiners: Henry Bayfield and John Somerscales, A.R.C.A. (London).*

A fair number of drawings done at the Evening and Day Examinations show careful and good work, but in a considerable number of exercises a falling off in method is apparent, accuracy of drawing giving place to a looseness and vagueness of execution, which may be suggestive and picturesque, but is not calculated to develop a sound knowledge of this subject.

DRAWING ON THE BLACKBOARD.—*Examiner: S. J. Cartlidge, A.R.C.A. (London), H.M.C.I.*

At Training Colleges a higher average standard of work was naturally to be looked for this year, as no "first year" students were admitted to the examinations; and it is gratifying to report that the exercises generally reached a high level, being quite up to anticipation. In many cases it was

quite evident that an excellent course of study had been followed, though here and there unmistakable signs of unwholesome cram in Memory Drawing were to be seen.

The level of last year is maintained in the work done at Schools of Art and Art Classes.

ARCHITECTURE.—*Examiner: Professor T. Roger Smith.*

The number of candidates was less than last year; the average quality of the work was, however, much higher.

Generally speaking, the work, and especially the drawings, done by those candidates who have gained high marks is unquestionably good, and there are few discreditable failures.

DRAWING FROM THE ANTIQUE.—*Examiners: Seymour Lucas, R.A., and W. F. Yeames, R.A.*

The Examiners consider the work done at this Examination as very satisfactory, and that the steady improvement in past years has been well maintained.

The number of good drawings is considerable, and amongst these some are entitled to be called excellent. Almost throughout, the manner adopted in drawing the statue is good, and the work done with intelligence and with apparent purpose, all of which throws credit on the various schools to which the candidates belong.

The Examiners are convinced that the marked intelligence imported into the work must be of great service to the students, whatever branch of Art they may have to follow in after years.

DRAWING THE ANTIQUE FROM MEMORY.—*Examiners: Seymour Lucas R.A., and W. F. Yeames, R.A.*

The Examiners are pleased to find an advance on the work sent up last year, and that a considerable number of drawings have obtained high awards.

DRAWING FROM LIFE. — *Examiners: Byam Shaw and H. S. Tuke, A.R.A.*

Comparing the result of this examination with that of last year, there is a considerable falling off in the quality of the work, which may be attributed in part to requirements under the new regulations in respect of memory drawing and the shorter time allowed at the examination for drawing from the life model.

There are a fair number of drawings which show intelligence and true feeling. Others, however, indicate merely a specious facility in execution.

ANATOMY.—*Examiners: Professor A. Thomson, M.A., M.B., and Professor R. Howden, M.A., M.B.*

There has been an ncrease in the number of papers received this year, and on the whole the standard of excellence is better than usual, though there are no papers of outstanding merit.

MEMORY DRAWING OF PLANT FORM.—*Examiner: W. G. Paulson Townsend.*

Generally speaking, this examination, in its first year, has been well understood. A certain small number of the papers show real excellence, and there is a large proportion of very good work. On the other hand, a number of the candidates have not been properly prepared for the examination, or have not shown that they fully comprehended the requirements, or were able to cope with them.

PAINTING ORNAMENT.—*Examiner: Lewis F. Day.*

Considering the difficulty of the new subject—that is to say, of making a design as well as painting it within the time allotted—the results of this examination are most satisfactory.

Students appear to have taken to it with a zest which, though it may be due partly to the novelty of it, is no doubt to some extent accounted for by the greater freedom allowed than by the old monochrome-painting exercise; and quite a number of them have done better than might have been expected.

PAINTING FROM STILL LIFE.—*Examiners: G. D. Leslie, R.A., and W. F. Yeames, R.A.*

The paintings, though fewer in number than last year, show a standard of excellence of a very satisfactory character.

There are not, it is true, more paintings of the highest merit than there were last year, but the number of exercises of good sound work is distinctly higher. Throughout, the students show more intelligence and perception of what is required in the way of tone, light and shade and refinement of colour.

PRINCIPLES OF ORNAMENT.—*Examiners: G. C. Haité and F. Hamilton Jackson.*

The average level of intelligence shown by candidates in answering the questions set is higher than that reached in last year's examination, though the Examiners find that the larger part of those students who attempted the most advanced question were quite unfitted to cope with the subject.

The results of this examination go far towards showing that if students in the mass are not capable of producing work of the highest order—which is scarcely to be expected—they are, at least, in a fair way of being enabled to form a critical and logical judgment upon any objects submitted for their consideration.

HISTORIC ORNAMENT.—*Examiners: J. H. Pollen and R. Phené Spiers.*

The answers were in some instances intelligent, but, taken as a whole, hardly up to the average of former examinations.

It is not possible to report favourably of the sketching. Quite apart from special preparation for an examination, the habit of sketching is necessary in order to store the memory with vivid impressions of the beauty of objects among the national treasures.

MODELLING FROM THE ANTIQUE.—*Examiners: T. Brock, R.A., and W. Goscombe John, A.R.A.*

The work done at this examination is fully up to the average, but, as usual, many of the students have been allowed to sit without being sufficiently prepared.

MODELLING THE HEAD FROM THE LIFE.—*Examiners: T. Brock, R.A., and W. Goscombe John, A.R.A.*

The Examiners are pleased to see that full advantage has been taken of this exercise, with the result that many excellent studies have been done.

The intention of this examination being to test advanced students in their knowledge of construction, it is to be regretted that so many have been allowed to sit without having had sufficient preliminary study.

MODELLING FROM LIFE.—*Examiners: T. Brock, R.A., and W. Goscombe John, A.R.A.*

The Examiners are pleased with the work done at this Examination, many of the exercises submitted being of considerable merit; attention, however, must still be drawn to the fact that a large proportion of the candidates presented for this examination had not been sufficiently prepared.

ARCHITECTURAL DESIGN.—*Examiner: Professor T. Roger Smith.*

The number of candidates was rather less than last year. The average quality of the work is, I believe, a little higher.

In considering the Architectural designs of students it must not be forgotten that there is a strong desire for novelty in the art at the present day, and that something like a system of design based on forms not hitherto in nse has ceen worked out for furniture and goldsmiths' work. Of those students who have failed in this examination many have keenly pursued novelty, and novelty only, without the necessary knowledge of architectural forms or the skill requisite for employing them.

Many of these designs of those who have passed—and those among the freshest and most vigorous—have at least a strong flavouring of the "Modern English" manner.

It is worth remark that, though there is one powerful design that is Tudor in character, there is no other to which the term Gothic can be applied; and it is also satisfactory that extremely few either of the weak, formal, hackneyed Renaissance designs, or of the designs based on the ordinary suburban villa, which in some years have been numerous, have been submitted this year. On the other hand, at least ten or twelve designs have been made, every one of which shows original power and a fair command of the features and details out of which a design is built up on paper.

DESIGN (ELEMENTARY STAGE).—*Examiners: T. Erat Harrison and W. G. Paulson Townsend.*

There is an increase in the number of exercises sent up this year, and, on the whole, a marked improvement in the quality of the work, both in design and execution. This improvement, like that of last year, is due to an increase of fairly good exercises and a diminution of very bad ones. There has not been any appreciable increase among the very good.

DESIGN (ADVANCED STAGE).—*Examiners: Walter Crane and Lewis F. Day.*

On the whole, it is satisfactory to state that the general character of the designs submitted, the type of ornament and its treatment, are in advance of what they were. There is, on the one hand, less harping upon stereotyped forms of design, and on the other less indulgence in reckless extravagance of line or form without reference to constructive necessities. The tone of the work seems generally healthier.

DESIGN (HONOURS).—*Examiners: John D. Batten and Walter Crane.*

The Examiners are glad to be able to note a very marked improvement in the character of the designs for a Medal—the more so as last year they had occasion to deplore the inadequacy of the papers received in response to a similar exercise. On the whole, indeed, it may be said that the candidates showed considerable sense of the requirements of a medal, and a capacity for representing figures in relief.

MODELLING DESIGN (ADVANCED STAGE).—*Examiners: D. McGill and Bertram MacKennal.*

The average of merit is higher, particularly in the sense that there is a smaller proportion of very bad designs.

There are a good many designs which reach a high standard of merit, and a few which are really excellent. The number of exercises which exhibit a thoroughly good treatment of mouldings is very small, and another prevailing fault is a tendency of over-enrichment.

MODELLING DESIGN (HONOURS).—*Examiners: T. G. Jackson, R.A., and W. Goscombe John, A.R.A.*

The Examiners consider that the quality of the work shown is inferior to that of last year.

Scarcely any of the designs show the slightest acquaintance with the principles of architectural design, and the Examiners would repeat what they said last year, that students should not be allowed to enter for this examination till they have had a sufficient training in architecture as well as in modelling.

5 (*d*). EXTRACTS FROM THE REPORTS OF THE EXAMINERS UPON THE WORKS SUBMITTED FOR NATIONAL COMPETITION FROM SCHOOLS OF ART, AND SCIENCE AND ART CLASSES, 1902.

MODELLING FROM THE ANTIQUE, MODELLING ORNAMENT FROM CASTS MODELLING FOLIAGE FROM NATURE.—*Examiners*: *H. H. Armstead, R.A.*; *T. Brock, R.A.*; *G. Simonds.*

Modelling the Figure in the Round from the Antique.—The Examiners notice with regret a decided falling off, both in the number and the quality of the works submitted this year for competition.

Modelling in Relief from Figures in the Round.—The work shows no improvement on that of last year. The Examiners accordingly regret that they are again unable to make any award.

Modelling Heads and Busts from the Antique.—The Examiners are glad to see that the improvement which was apparent last year has been maintained.

Modelling Ornament from Casts.—The works in general show little appreciation by the students of the refinement of the curves of the originals, and of the play of light and shade on the ornament.

Modelling Foliage from Nature.—The quality of work, though good, hardly reaches the standard of last year. Having regard to the value of this study it is to be regretted that so small a number of works is submitted.

MODELLING THE HUMAN FIGURE FROM NATURE.—*Examiners*: *T. Brock, R.A.*; *W. R. Colton*; *W. Goscombe John, A.R.A.*

Modelling Heads in the Round from Life.—The work in this subject shows an improvement on that of last year, though there is a decrease in the number of examples.

Modelling the Human Figure in the Round from Life.—The quality of the work as a whole is similar to that of last year.

Modelling the Human Figure in Relief from Life.—The works submitted show some slight improvement, but it is to be regretted that there is not a better competition, as the subject is a very important one and its careful pursuit must prove of the greatest benefit to the student.

MODELLING DESIGN.—*Examiners*: *H. H. Armstead, R.A.*; *T. Brock, R.A.*; *T. G. Jackson, R.A.*

Though the quality of the work submitted is not high, it reaches the standard of last year's Competition.

In decorative work, sculpture and architecture are necessarily combined, and ought to be equally well executed. The Examiners regret that in no case has the architectural setting been successfully treated this year.

DRAWING FROM THE ANTIQUE, DRAPERY, ETC.—*Examiners*: *H. Draper*; *Seymour Lucas, R.A.*; *W. F. Yeames, R.A.*

Drawings of Heads.—With one or two exceptions the quality of the work is much below the average.

Drawings of Hands and Feet.—The Examiners regret that, with one exception, the drawings submitted show no improvement upon last year's work.

Drawing the Full Length Figure.—Though hardly reaching the level of former years, the work includes several excellent drawings. A pleasing feature that the Examiners notice this year is the method and delicacy of execution in the majority of the works.

Drapery upon the Antique Figure.—The Examiners observe with regret that the quality of the work has fallen off. None of the studies reach the standard required for the award of a Silver Medal.

Anatomical Studies of the Human Figure.—The work is not quite equal in delicacy and excellence of drawing to that of last year.

DRAWING AND PAINTING FROM THE LIVING MODEL.—*Examiners*: *E. J. Gregory, R.A.*; *H. S. Tuke, A.R.A.*; *W. F. Yeames, R.A.*

Drawing Heads from Life.—The Examiners are pleased with the work in this subject, and although there is nothing which reaches the standard for a Silver Medal award the work generally is of a high average.

Details: *Hands and Feet.*—The Examiners are pleased with the show of work in this subject.

Drawing Full Length Figures.—Although there is no drawing worthy of a Gold Medal the general level of the work is high and the method of execution generally adopted is suitable to the exercise.

Time Studies.—The Examiners are pleased with the large display of works in this particularly useful study.

Drapery Studies.—The Examiners are pleased with the efforts made by the students in this subject, but are disappointed with the results, considering the work that has been submitted in previous years.

Painting Heads from Life.—The Examiners are disappointed with the work in this subject.

Painting the Figure from Life.—The work in this class is below what the Examiners expect to see.

PAINTING FROM FLOWERS AND STILL LIFE.—*Examiners*: *H. H. La Thangue, A.R.A.*; *G. D. Leslie, R.A.*; *W. F. Yeames, R.A.*

The Examiners would like to point out that although a Still Life painting may be a beautiful work of Art, the principal motive for the student in painting from Still Life should be to obtain experience of a technique which he has not hitherto mastered. Instead of this, in the majority of examples submitted to them, the Examiners regret to find the study of Still Life regarded too much as an end in itself; much time and labour being wasted in elaborating representations of groups of objects arranged with a view to pictorial effect. Works of this description are in the opinion of the Examiners of little educational value.

Painting in Oil Colours: Flowers and Still Life.—The Examiners feel that the work does not reach the standard of former years. With but few exceptions a want of interest on the part of the students is still apparent, and the Examiners repeat their remark of last year, that painting from Still Life, which should be a delightful study, seems to be regarded as a wearisome task; the result is that the work in general is more remarkable for patient labour than artistic spirit.

Painting in Water Colours: Flowers and Still Life.—The average of the work in this class is below that of last year, and the Examiners regret that a want of mental activity is shown in the majority of the works which leads to little but misapplied industry.

Studies of Buildings.—The Examiners are glad to see more studies of old buildings of interest in the vicinity of the schools from which they come, and that the quality of the work is better than usual. Two very creditable tone studies were sent from Wellington, New Zealand.

PAINTING FLOWERS WITHOUT BACKGROUNDS, STUDIES OF PLANTS IN PREPARATION FOR DESIGN.—*Examiners*: *E. F. Brewtnall*; *Walter Crane*; *G. D. Leslie, R.A.*

Painting Flowers without Backgrounds.—The standard in quality of the work in this class is well maintained.

Studies of Plants, &c., in preparation for Design.—The Examiners are pleased to see that some pains have been taken to meet the suggestions made in last year's report. As a whole the work shows careful observation and conscientious workmanship.

BOOK ILLUSTRATIONS, LETTERING, DESIGNS FOR COLOUR PRINTS, POSTERS, AND BOOK COVERS.—*Examiners*: *W. Crane*; *T. Erat Harrison*; *H. Holiday.*

Book Illustrations.—The quality of the work as a whole hardly reaches the level of former years. The Examiners are, however, pleased to observe that this year there is less extravagance and affectation.

Lettering.—The Examiners are pleased to see that the subject of lettering has been seriously studied, both from the point of view of spacing as well as form of type. On the whole the work is very creditable.

Colour Prints.—More attention appears to have been paid this year to the adaptation of the drawings to the various processes of reproduction. The work in this class continues to maintain its standard, and the subject seems to attract a good deal of attention in the different schools.

Posters.—The show of works in this class is not remarkable either for quality or quantity, but this may be a sign that students have spent their time more profitably upon less ephemeral kinds of design.

Book Covers.—The designs in this class are not inferior to those of last year, but the design for tooled covers again show most taste. Their suitability for reproduction is in most cases proved by the executed covers accompanying them.

LACES, EMBROIDERY AND DAMASKS.—*Examiners*: *A. F. Brophy*; *A. S. Cole, C.B.*; *W. Crane.*

Designs for Wearing Laces and Lacelike Articles.—In this class the standard of work is well maintained. The designs show more variety than is usually the case and are in general better adapted to the various processes employed. Devices based on natural forms are freely introduced into many of the designs and are treated as a rule successfully and consistently.

Designs for Embroidery.—The quality of the work this year attains a higher level than before, taste and restraint being, as a rule, noticeable. The designs showed that thought had been given both to the purpose for which they were intended, and to the materials in which they were to be executed.

Designs for Damasks.—The Examiners regret that the work does not reach the level of last year. A number of capable designs are submitted in which the conditions of the material are fairly met.

STENCILS AND CARPETS.—*Examiners*: *W. Crane*; *Lewis F. Day*; *J. H. Dearle.*

Designs for Stencil Hangings.—The general standard of work is good, many competent designs being submitted in which less extravagance and more taste is noticeable than in former years.

Designs for Carpets.—The Examiners are disappointed to find so few good specimens in this useful and interesting class of design. Some of the drawings are workmanlike, but very commonplace.

PRINTED TEXTILES, WOVEN TEXTILES, LACE FOR HANGINGS, EMBROIDERY, MOSAICS.—*Examiners*: *A. F. Brophy*; *Lewis F. Day.*

Designs for Printed Muslins.—These designs maintain a high level. In general there is a precision about the drawings which the Examiners are glad to see. The majority of the works submitted are distinguished by a prettiness and delicacy which is essential in designs for this material.

Designs for Printed Hangings.—The Examiners regret that this very important branch of design has not had sufficient attention paid to it, and that the students have not taken advantage of the scope which cotton printing offers.

Designs for Woven Textiles.—The Examiners regret that more attention is not given by the students to this important class of design. They note, however, with satisfaction that the designs by students who appear to be under technical instruction in weaving show a very fair level of taste, especially in the case of small patterns of two colours, in which due consideration seems to have been given to the effect of the reduction which ensues when the patterns are carried out in the material and there repeated, generally on a smaller scale than that of the drawings. On the other hand the larger and more ambitious designs are not executed in an entirely workmanlike manner.

Designs for Lace Curtains.—The quality of the work in this class is exceedingly poor, and the Examiners regret to see so little effort in this direction.

Designs for Embroidery for Curtains, etc.—The quality of the work in past years has been much superior to that now submitted.

Designs for Mosaics.—Though the number of designs submitted is small, a high standard of excellence is reached.

INTERNAL DECORATIONS, FURNITURE, STAINED GLASS AND IRONWORK.—*Examiners*: *T. G. Jackson, R.A.*; *Seymour Lucas, R.A.*; *Sir W. B. Richmond, K.C.B., R.A.*

Designs for Internal Decorations and for Furniture.—The work in this class of study is very inferior to that of last year. It is to be regretted that the tendency towards eccentricity for eccentricity's sake is on the increase. The apparent aim of the majority of the students cannot be expressed better than in the words of one of the competitors—"The main aim in this design is individuality and quaintness."

Designs for Stained Glass.—There are not so many exhibits of a high class this year. The Examiners regret that there should be a falling off in this important and educational branch of study, which ought to be encouraged.

Designs for Ironwork.—The Examiners regret that the designs submitted in this important branch of fine art industry do not reach a higher level. They observe that in the majority of cases the construction of the ironwork is not sufficiently understood.

METAL WORK, ENAMELS, JEWELLERY.—*Examiners*: *A. F. Brophy*; *W. Crane*; *Nelson Dawson.*

Designs for Metal Work.—The level of the work is high, and the Examiners are of opinion that a greater knowledge of the practical requirements is shown this year; they still, however, observe here and there a tendency to repeat hackneyed forms.

Designs for Enamels.—The Examiners are pleased to see that the designs, as a whole, show great progress in the appreciation of the technical difficulties in the art of enamelling.

Designs for Jewellery.—The designs for Jewellery show rather more variety this year, though there is a tendency to follow the current fashionable forms instead of originating those forms which are more suitable for the purpose and the material employed.

POTTERY, TILES, PANELS AND FRIEZES.—*Examiners*: *S. J. Cartlidge*; *W. De Morgan*; *R. H. A. Willis.*

Pottery.—The average quality of the work submitted in this class is very good, perhaps even equal to that of last year. Though the difficulties of the material have not yet in all cases been surmounted there is a distinct advance in this respect.

Tiles.—Though the designs in this class hardly reach last year's standard, the Examiners notice that, in general, attention has been paid to the necessities of the material.

Panels and Friezes.—Much excellent work is presented this year in which a good understanding of the processes of stencilling is shown.

HISTORIC ORNAMENT.—*Examiners*: *T. Erat Harrison*; *Edward S Prior*; *Sir W. B. Richmond, K.C.B., R.A.*

Historic Ornament.—The Examiners notice with regret that the require ments of studies of Historic Ornament are not yet completely understood, too many pictorial or still life studies instead of working drawings being submitted.

MEASURED ARCHITECTURAL DRAWINGS; ARCHITECTURAL DESIGNS.—*Examiners*: *J. Belcher, A.R.A.*; *Reginald Blomfield*; *T. G. Jackson, R.A.*

Architectural Drawings from Actual Measurements.—This year there are fewer exhibits in this class of study than usual, and the average quality of the work is poor.

Architectural Designs.—Few meritorious designs are submitted this year.

6. LIST OF GOLD MEDALLISTS IN THE NATIONAL COMPETITION, 1902.

School.	Name.	Subject.	Description.
BATTERSEA (POLYTECHNIC) - -	†Gray, Naomi Sybil	23 c.	Design for an embroidered bed-spread.
BIRMINGHAM -	*Bunn, Fanny -	23 d.	Design for an enamelled panel.
LIVERPOOL (MOUNT STREET)	§Dodd, Albert W. -	23 d.	Design for a stencilled panel of a portière.
NEW CROSS - -	Halnon, Frederick	19 e.	Model of a figure from the nude.
SHEFFIELD - -	Hobbis, Charles W.	22 d. (for 2)	Studies of historic styles of ornament.

* The "Princess of Wales" Scholarship of £25 has been awarded to this student.

† The "Princess of Wales" Scholarship of £11 has been awarded to this student.

§ This student is ineligible to receive the Gold Medal, as he has not complied with the conditions of par. (b.) of "Details as to award of Medals for Art Works, at page 106 of Directory, 1901."

6—(*continued*). LIST OF ART STUDENTS ELECTED TO SCHOLARSHIPS UNDER THE BRITISH INSTITUTION SCHOLARSHIP FUND.

The British Institution Scholarship Fund is regulated by Scheme of the Charity Commissioners providing, *inter alia*, for the establishment of Art Scholarships of the value of £50 a year and tenable for two years. The Scholarships, which are usually held at Institutions for High Art Instruction, are awarded in different branches of Art by a Body of Trustees on which the Board of Education are represented.

The following Art Students were elected to Scholarships in 1902:—

In Painting:

William Charles Penn.
Thomas Cantrell Dugdale.

In Sculpture:

Richard George Philip.

In Engraving:

No Award.

In Architecture:

No Award.

Appendix A.

General Statistics of Examinations in Schools of Science and Science Classes in 1901 and 1902.

	1901.	1902.
Schools recognised by the Board as eligible for grants	1,630*	1,865*
Classes in the same	12,703*	13,416*
Individuals under instruction in the same	144,417*	180,900*
Of whom there came up for examination	48,865*	46,153*
Individuals examined in addition to the above: Students of schools ineligible for grants; and self-taught students	6,381*	7,244*
Papers worked in :—		
Subject.		
I. Practical Plane and Solid Geometry	4,691	2,997
II. Machine Construction and Drawing	8,454	8,345
III. Building Construction	7,511	6,366
IV. Naval Architecture	897	922
V. Mathematics	14,031	12,564
V.*p* Practical Mathematics	307	606
VI.A Theoretical Mechanics (Solids)	1,882	1,660
VI.B ,, ,, (Fluids)	765	766
VII. Applied Mechanics	2,429	2,169
VIII. Sound, Light, and Heat (Elementary Stage)	949	678
VIII.A Sound (Advanced Stage and Honours)	314	271
VIII.B Light ,, ,, ,,	299	315
VIII.C Heat ,, ,, ,,	986	882
IX. Magnetism and Electricity	4,870	4,513
X. Inorganic Chemistry	8,568	7,279
X. ,, ,, (Practical)	5,624	4,664
XI. Organic Chemistry	492	469
XI. ,, ,, (Practical)	455	401
XII. Geology	401	340
XIII. Mineralogy	104	84
XIV. Human Physiology	3,855	2,680
XV. General Biology	83	89
XV. ,, ,, (Section I.)	26	29
XVI. Zoology	41	49
XVII. Botany	1,573	1,241
XVIII. Principles of Mining	1,953	1,994
XIX. Metallurgy	288	288
XIX. ,, (Practical)	252	245
XX. Navigation	93	98
XXI. Nautical and Spherical Astronomy	50	40
XXII. Steam	2,366	2,136
XXIII. Physiography	10,332	6,426
XXIII. ,, (Section I.)	1,748	1,546
XXIV. †Agricultural Science and Rural Economy	390	299
XXV. Hygiene	6,305	3,920
XXV. ,, (Section I.)	242	512
Total number of Papers worked	93,626	77,883

* These figures do not include statistics relating to Schools in Scotland or Ireland.

† This subject was named "Principles of Agriculture" previous to 1902.

GENERAL STATISTICS OF EXAMINATIONS IN SCHOOLS OF SCIENCE AND SCIENCE CLASSES—*cont.*

	1901.		1902.	
	Day.	Evening.	Day.	Evening.
Provincial Centres where Examinations were held	427	1,172	395	874
Metropolitan Centres where Examinations were held	54	45	39	30

Papers in the Elementary Stage	50,014	39,687
1st Class successes	15,635*	11,277†
2nd " "	18,412	13,244
Failures	15,967	15,166
Papers in the Advanced Stage	40,287	34,752
1st Class successes	5,237	4,432
2nd " "	20,378	16,327
Failures	14,672	13,993
Papers in Honours	3,325	3,444
Passes (Honours not divided into parts)	47	11
Failures " "	135	54
1st Class successes (Part II.)	33	23
2nd " " "	77	81
Failures "	293	279
Passes (Part I.)	841	704
Failures "	1,899	2,292
Total Papers worked	93,626	77,883
Total Successes	60,660	46,099
Total Failures	32,966	31,784

* This number includes 692 passes in Section I. of Subject XXIII. Physiography; 2 passes in Section I. of Subject XV. General Biology; and 170 passes in Section I. of Subject XXV. Hygiene.

† This number includes 7 passes in Section I. of Subject XV. General Biology; 581 passes in Section I. of Subject XXIII. Physiography; and 362 passes in Section I. of Subject XXV. Hygiene.

Appendix B.

General Statistics of Examinations held at Art Schools and Classes in 1901 and 1902.

	1901.	1902.
Number of Schools recognised by the Board as eligible for Grants	1,898*	1,355*
Individuals under instruction in the same	113,194*	110,873*
Students under instruction who came up for examination	44,285*	39,859*
Individuals examined in addition to the above who belonged to Schools not eligible for Grants or were self-taught	4,103*	5,302*
Papers worked in—		
Freehand Drawing in Outline	32,139	20,735
Model Drawing	20,355	19,305
Drawing in Light and Shade from a Cast	14,124	11,700
Geometrical Drawing, Subject 1*a*	11,848	10,572
Perspective	3,586	4,129
Memory Drawing of Plant Form	No Exam.	2,045
Architecture, Subject 1*d*	612	512
Principles of Ornament, Subject 22	978	827
Design, Subject 23*c* (Elementary Stage)	935	1,386
Do. 23*c* (Advanced Stage)	1,441	1,340
Do. 23*d* (Honours)	249	219
Painting Ornament, Subject 11–23	1,325	1,132
Drawing from the Antique, Subject 8*b*^{2}	1,841	1,469
Anatomy, Subject 9	429	487
Historic Ornament, Subject 22*d*	170	200
Painting from Still Life, Subject 15	1,429	1,368
Drawing from Life	1,561	1,435
Drawing the Antique from Memory, Subject 8*f*	453	422
Modelling Design, Subject 23*e* (Advanced Stage)	566	539
Modelling Design, Subject 23*f* (Honours)	89	75
Modelling from the Antique, Subject 19*b*^{1}	720	673
Modelling the Head from Life, Subject 19*d*	No Exam.	386
Modelling from Life, Subject 19*h*	229	225
Architectural Design, Subject 23*b*	123	108
Drawing on the Blackboard	3,806	7,956
Total Papers worked	99,009	89,245
Provincial Centres where Examinations were held — Evening	870	767*
Provincial Centres where Examinations were held — Day	329	305*
Metropolitan Centres where Examinations were held — Evening	54	45
Metropolitan Centres where Examinations were held — Day	60	42
Total Papers worked	99,009	89,245
Total Successes	49,595	51,547
Total Failures	49,414	37,698

* These figures do not include statistics relating to Schools in Scotland or Ireland.

APPENDIX C.

GENERAL STATISTICS OF EVENING SCHOOLS UNDER ARTICLE 17 OF THE MINUTE OF 3 JULY, 1901.

Number of SCHOOLS paid Grants		5,198
Number of SCHOLARS who have attended at all during the Session		527,729
Average per school		101
BOYS AND MEN.	Between 12 and 15 years of age	81,629
	Percentage	26·2
	Between 15 and 21 years of age	176,205
	Percentage	56·7
	Over 21 years of age	53,266
	Percentage	17·1
	Total	311,100
GIRLS AND WOMEN.	Between 12 and 15 years of age	45,343
	Percentage	20·9
	Between 15 and 21 years of age	113,191
	Percentage	52·3
	Over 21 years of age	58,095
	Percentage	26·8
	Total	216,629
Number of SCHOLARS for whom Grants are claimed		324,709
Average per school		62
BOYS AND MEN.	Between 12 and 15 years of age	51,051
	Percentage	27·1
	Between 15 and 21 years of age	106,457
	Percentage	56·6
	Over 21 years of age	30,761
	Percentage	16·3
	Total	188,269
GIRLS AND WOMEN.	Between 12 and 15 years of age	28,509
	Percentage	20·9
	Between 15 and 21 years of age	71,003
	Percentage	52·0
	Over 21 years of age	36,928
	Percentage	27·1
	Total	136,440

Percentage of SCHOLARS for whom Grants are claimed to Scholars who attended at all during the Session :—		
BOYS AND MEN.	Between 12 and 15 years of age	62·5
	Between 15 and 21 years of age	60·4
	Over 21 years of age	57·7
	Total	60·5
GIRLS AND WOMEN.	Between 12 and 15 years of age	62·9
	Between 15 and 21 years of age	62·7
	Over 21 years of age	63·6
	Total	63·0
Total of all Scholars		61·5
Number of SCHOLARS admitted without payment of Fees		207,119
Number of SCHOLARS for whom Grants were paid for :—		
	One Subject of Instruction	147,594
	Two Subjects of Instruction	82,089
	Three Subjects of Instruction	59,909
	Four Subjects of Instruction	35,117
	Total	324,709
TEACHERS.—Number of Masters		13,903
Number of Mistresses		7,245
	Total	21,148
GRANTS.—Number of Schools paid Grants		5,198
		£ *s.* *d.*
Total Grant Paid		172,557 14 11
Average per School		33 3 11
Average per Scholar receiving Grants		0 10 8
Percentage paid at the rate of 2/6 per complete 20 hours		·5
Percentage paid at the rate of 3/- per complete 20 hours		82·2
Percentage paid at the rate of 3/6 per complete 20 hours		4·8
Percentage paid at the rate of 4/- per complete 20 hours		11·5
Percentage paid at the rate of 4/6 per complete 20 hours		·5
Percentage paid at the rate of 5/- per complete 20 hours		·5

Subjects of Instruction.	Number of Schools in which taught.	Number of Students qualified for Grant.
Reading, Writing, Arithmetic, or two or three of these subjects combined	3,661	140,673
Needlework	1,820	58,235
Vocal Music	1,026	30,494
Geography, History, or both combined	2,100	50,187
Life and Duties of a Citizen, or Political Economy	230	5,031
English (language or literature), or Welsh	411	11,076
Drawing	2,223	52,390
French	678	17,312
German	188	3,090
Any other language	98	2,102
Mathematics (including Euclid, Algebra, Mensuration)	741	12,974
Mechanics, or Physics (including Sound, Light, and Heat; Magnetism and Electricity)	134	2,389
General Elementary Science (including Science of Common Things, Physiography, and Elementary Physics and Chemistry)	455	9,530
Chemistry	186	4,191
Other branches of Science	116	2,446
Commercial Correspondence	604	14,229
Book-keeping	1,214	32,283
Shorthand	1,487	54,206
Woodwork	1,162	23,671
Metalwork	81	1,886
Domestic Science (including Hygiene, Domestic Economy)	570	13,109
Ambulance, or Home Nursing	705	18,467
Cookery	946	22,902
Laundry Work	178	2,475
Dressmaking, or Millinery	527	13,918
Gardening, Horticulture, or Agriculture	177	2,831
Other Subjects, including Basket Work, Typewriting, Surveying, Navigation, Clay Modelling, Leatherwork, Law, Elocution, &c.	144	2,401

BOARD OF EDUCATION.

GENERAL REPORTS

ON

HIGHER EDUCATION

WITH APPENDICES

FOR THE YEAR 1902.

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